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Indian Standard

ROLLING BEARINGS — VOCABULARY

(First Revision)

UDC 001·4 : 621·822·6

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 13

November 1988

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Indian Standard

ROLLING BEARINGS — VOCABULARY

(First Revision)

National Foreword

This Indian Standard (First Revision), which is identical with ISO 5593-1984 'Rolling bearings — Vocabulary', issued by the International Organization for Standardization (ISO), was adopted by the Bureau of Indian Standards on the recommendation of the Rolling Bearings Sectional Committee and approval of the Engineering Division Council.

The original version of this standard was published in 1964. The revision has been made in order to harmonize this Indian Standard with the International Standard by adoption of ISO 5593-1984.

Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard'.

Additional Information

This Indian Standard is the national implementation of ISO 5593-1984; as such only the English text has been reproduced. If the French text is required, reference should be made to original ISO publication.

Rolling Bearings Sectional Committee, EDC 39 [Ref : Doc : EDC 39 (5160)]

Adopted 19 February 1988

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1 Scope and field of application

This International Standard establishes a vocabulary of terms, with their definitions, applied in the field of rolling bearings and their technology. The terms and definitions are given in English and French.

NOTE – Only terms which are particular to the pertinent field, or which in this field are defined in a particular way, are included.

2 Principles and rules followed

2.1 Organization of the Vocabulary

The Vocabulary comprises

a) terms, with their definition, in systematic order (see clause 3);

b) figures with index numbers of relevant terms (see clause 4);

c) alphabetical listings of the terms, with their index numbers.

The Vocabulary can be used in several ways:

- if a term is known in either language, its index number is established in the pertinent alphabetical listing and then the definition of the term, its equivalent in the other language, and references to illustrations may be found in clause 3;
- a bearing, part or dimension may be identified in one of the figures of clause 4, giving the index numbers of the relevant terms in clause 3;
- a required term, with definition, may be established directly by means of a search in clause 3.

2.2 Organization of clause 3 on terms and definitions

The terms and definitions are given in groups and sub-groups, arranged in systematic order.

A two-digit serial number is assigned to each group, beginning with 01 for Bearings.

Each group is divided into sub-groups, to each of which is assigned a 4-digit serial number, the first two digits being those of the group.

Each entry (see 2.2.1) is assigned a 6-digit index number, the first four digits being those of the sub-group.

In order that the various language versions of the Vocabulary shall be conveniently linked, the numbers assigned to groups, sub-groups and entries are the same for both languages.

2.2.1 Organization of an entry

Each entry contains an index number, the term and the text of the definition.

An entry may also include a note and/or reference to one or more figures in clause 4 [for example (Figure 5.)].

The index number and the term are printed in bold typeface. In some entries the term is followed by a qualifier. A qualifier is printed in normal typeface in parentheses and indicates a directive for the use of the term or a particular field of application of the term as defined

The absence of a generally accepted term for the concept in the language is indicated by a row of dots.

2.2.2 Use of parentheses

In some terms a word or words printed in bold typeface are placed between parentheses. These words are part of the complete term, but they may be omitted when use of the abridged term does not introduce ambiguity.

In some entries the terms are followed by words in parentheses in normal typeface. These words are qualifiers (see 2.2.1) and not part of the term.

2.2.3 Use of [square] brackets

When several closely related terms can be defined by the same texts apart from a few words, the terms and their definitions are grouped in a single entry. The words to be substituted for those which precede them in order to obtain the different meanings are placed in brackets, i.e. [ ], in the same order in the term and in the definition.

2.2.4 Use of italic typeface

A term printed in italic typeface in a definition or a note is defined in another entry of the Vocabulary. It is only printed in italic typeface the first time it occurs in each entry.

The basic form of each such term is included in the alphabetical index, where the index number of the corresponding entry is shown.

2.3 Organization of clause 4 on figures

The figures are principally arranged in the same order as that in which the terms they illustrate are given in clause 3.

Each figure gives the index numbers of relevant terms. A figure usually shows only one example of the several existing forms of a bearing or part. In most cases the figures are simplified and leave out unnecessary details.

2.4 Organization of the alphabetical indexes

The alphabetical indexes include all terms, in either language, given and defined in clause 3. Multiple-word terms appear in alphabetical order both by natural order of words and by their key words.

The alphabetical index refers to the index number of the entry in clause 3 where the term is defined.

3 Terms and definitions

01 Bearings

01.01 Rolling bearings — General

01.01.01
rolling bearing
A bearing operating with rolling (rather than sliding) motion between the parts supporting load and moving in relation to each other. It comprises *raceway* members and *rolling elements* with or without means for their spacing and/or guiding. May be designed to support radial, axial or combined radial and axial load. (Figures 1 to 33.)

01.01.02
single row (rolling) bearing
A *rolling bearing* with one row of *rolling elements*. (Figures 1 to 4, 6, 8 to 15, 17, 18, 21 to 24, 27 to 31.)

01.01.03
double row (rolling) bearing
A *rolling bearing* with two rows of *rolling elements*. (Figures 5, 7, 16, 20, 25, 26.)

01.01.04
multi-row (rolling) bearing
A *rolling bearing* with more than two rows of *rolling elements* supporting load in the same direction. It is preferable to specify the number of rows and type of bearing, for example "four row cylindrical roller radial bearing". (Figure 19.)

01.01.05
full complement (rolling) bearing
A *rolling bearing* without a *cage* and in which the sum of the clearances between the *rolling elements* in each row is less than the diameter of the rolling elements and small enough to give satisfactory function of the bearing. (Figures 14, 22, 23.)

01.01.06
angular contact (rolling) bearing
A *rolling bearing* with a *nominal contact angle* greater than 0° but less than 90°. (Figures 4, 5, 7, 10, 12, 16, 17, 20, 21, 27, 29, 31.)

01.01.07
rigid (rolling) bearing
A *rolling bearing* which resists misalignment between the axes of its *raceways*. (Figures 1 to 6, 8 to 14, 17 to 30.)

01.01.08
self-aligning (rolling) bearing
A *rolling bearing* which can accommodate angular misalignment and angular motion between the axes of its *raceways* due to one raceway being *spherical*. (Figures 7, 15, 16, 31.)

01.01.09
external aligning (rolling) bearing
A *rolling bearing* which can accommodate angular misalignment between its *axis* and the axis of its *housing* by means of a spherical form on one *ring* or *washer* surface, which mates with a complementary seat surface in an *aligning housing ring*, in an *aligning seat washer* or in the housing. (Figure 8.)

01.01.10
separable (rolling) bearing
A *rolling bearing* with separable *sub-units*. (Figures 6, 9 to 14, 19 to 21, 24 to 26, 28 to 31.)

01.01.11
non-separable (rolling) bearing
A *rolling bearing* from which, after final manufacturing assembly, neither *bearing ring* can be freely separated. (Figures 1 to 5, 7, 8, 15 to 17, 22, 23, 27.)

01.01.12
split (rolling) bearing
A *rolling bearing* with both *rings* and the *cage*, if used, divided into two semicircular pieces to facilitate mounting. (Figure 18.)

NOTE — For a bearing with parts divided in a different manner, for example, a bearing with a *two-piece ring* (02.01.08), there is no established short term.

01.01.13
metric (rolling) bearing
A *rolling bearing* originally designed with *boundary dimensions* and tolerances primarily in round metric units.

01.01.14
metric series (rolling) bearing
A *rolling bearing* which conforms to a metric series of an ISO *dimension plan*.

01.01.15
inch (rolling) bearing
A *rolling bearing* originally designed with *boundary dimensions* and tolerances in imperial (inch) units.

01.01.16
inch series (rolling) bearing
A *rolling bearing* which conforms to an inch series of an ISO *dimension plan*.

01.01.17
open (rolling) bearing
A *rolling bearing* with neither *seals* nor *shields*. (Figures 1, 4 to 7, 9 to 19, 21, 24 to 31.)

01.01.18
sealed (rolling) bearing
A *rolling bearing* which is fitted with a *seal* on one or both sides. (Figures 2, 8, 20.)

01.01.19
shielded (rolling) bearing
A *rolling bearing* which is fitted with a *shield* on one or both sides. (Figure 3.)

01.01.20
capped (rolling) bearing
A *rolling bearing* which is fitted with one or two *seals*, one or two *shields* or with one seal and one shield. (Figures 2, 3, 8, 20.)

01.01.21
prelubricated (rolling) bearing
A *rolling bearing* which has been charged with lubricant by the manufacturer.

01.01.22
airframe (rolling) bearing
A *rolling bearing* which, by reason of design or execution, is intended for use in the general structure of an aircraft, including its control systems.

01.01.23
instrument precision (rolling) bearing
A *rolling bearing* which, by reason of design or execution, is intended for use in instruments.

01.01.24
railway axlebox (rolling) bearing
A *rolling bearing* which, by reason of design or execution, is intended for use in railway axleboxes. The most common type is *radial roller bearing*. (Figure 20.)

01.01.25
matched (rolling) bearing
One of the *rolling bearings* in a *matched pair* or a *matched stack*.

01.02 Radial bearings

01.02.01
radial (rolling) bearing
A *rolling bearing* designed to support primarily *radial load*, having a *nominal contact angle* between 0° and 45° inclusive. Principal parts are *inner ring*, *outer ring* and *rolling elements* with or without a *cage*. (Figures 1 to 23.)

01.02.02
radial contact (rolling) bearing
A *radial rolling bearing* with a *nominal contact angle* of 0°. (Figures 1 to 3, 6, 8, 11, 13 to 15, 18, 19, 22, 23.)

01.02.03
angular contact radial (rolling) bearing
A *radial rolling bearing* with a *nominal contact angle* greater than 0° up to and including 45°. (Figures 4, 5, 7, 10, 12, 16, 17, 20, 21.)

01.02.04
insert (rolling) bearing
A *radial rolling bearing* with a *spherical outside surface* and an *extended inner ring* with a locking device. Primarily intended for use in a simple type of housing. (Figure 8.)

01.02.05
tapered bore (rolling) bearing
A *radial rolling bearing* with an *inner ring* with *tapered bore*. (Figures 7, 19.)

01.02.06
flanged (rolling) bearing
A *radial rolling bearing* with an external radial flange on one of its rings, usually the *outer ring* or *cup*. (Figure 21.)

01.02.07
track roller (rolling bearing)
A *radial rolling bearing* with a heavy section *outer ring*, intended for use as a roller to roll on a track, for example a cam track. (Figures 22, 23.)

01.02.08
yoke type track roller (rolling bearing)
A *track roller rolling bearing* intended for mounting in a yoke. (Figure 22.)

01.02.09
stud type track roller (rolling bearing)
A *track roller rolling bearing* in which the inner member is extended on one side in the form of a shaft for cantilever mounting of the bearing. (Figure 23.)

01.02.10
universal matching (rolling) bearing
A *radial rolling bearing* which, when used together with one or more similar bearing(s), selected at random, yields predetermined characteristics in a *paired* or *stack mounting*.

01.03 Thrust bearings

01.03.01
thrust (rolling) bearing
A *rolling bearing* designed to support primarily *axial load*, having a *nominal contact angle* greater than 45° up to and including 90°. Principal parts are *shaft washer*, *housing washer* and *rolling elements* with or without a *cage*. (Figures 24 to 31.)

01.03.02
axial contact (rolling) bearing
A *thrust rolling bearing* with a *nominal contact angle* of 90°. (Figures 24 to 26, 28, 30.)

01.03.03
angular contact thrust (rolling) bearing
A *thrust rolling bearing* with a *nominal contact angle* greater than 45° and smaller than 90°. (Figures 27, 29, 31.)

01.03.04
single-direction thrust (rolling) bearing
A *thrust rolling bearing* intended to support *axial load* in one direction only. (Figures 24, 26, 28 to 31.)

01.03.05
double-direction thrust (rolling) bearing
A *thrust rolling bearing* intended to support *axial load* in both directions. (Figures 25, 27.)

01.03.06
double row double-direction thrust (rolling) bearing
A *double-direction thrust rolling bearing* having two rows of *rolling elements*, each supporting *axial load* in one direction only. (Figure 25.)

01.04 Linear bearings

01.04.01
linear (motion) (rolling) bearing
A *rolling bearing* designed for linear relative motion between its *raceways* in the direction of rolling. (Figures 32, 33.)

01.04.02
recirculating ball [roller] linear bearing
A *linear motion rolling bearing* with means for the recirculation of the *balls* [*rollers*]. (Figure 33.)

01.05 Ball bearings

01.05.01
ball bearing
A *rolling bearing* with *balls* as *rolling elements*. (Figures 1 to 10, 24 to 27, 33.)

01.05.02
radial ball bearing
A *radial rolling bearing* with *balls* as *rolling elements*. (Figures 1 to 10.)

01.05.03
groove ball bearing
A *radial ball bearing* the *raceways* of which are grooves generally with a cross-section of an arc of a circle with a radius slightly larger than half the *ball diameter*. (Figures 1 to 6, 8 to 10.)

01.05.04
deep groove ball bearing
A *radial ball bearing* in which each ring has uninterrupted *raceway grooves* with a cross-section matching about 1/3 of the ball circumference. (Figures 1 to 3, 8.)

01.05.05
filling slot (ball) bearing
A *groove ball bearing* having a *filling slot* in one *shoulder* of each ring to permit the insertion of a larger number of balls than in a *deep groove ball bearing*. (Figure 5.)

01.05.06
counterbored ball bearing
A *groove ball bearing* with one *outer ring shoulder* completely or partly removed. (Figure 6.)

01.05.07
magneto (ball) bearing
A *radial contact groove ball bearing* with one *outer ring shoulder* completely removed, making this ring separable. (Figure 6.)

01.05.08
three point contact (ball) bearing
A *single row radial ball bearing* in which, when under purely *radial load*, each loaded ball makes contact with one of the *raceways* at two points and with the other raceway at one point. Under pure *axial load* on the bearing, each ball makes contact with each raceway at only one point. (Figure 9.)

01.05.09
four point contact (ball) bearing
A *single row angular contact ball bearing* in which, when under purely *radial load*, each loaded ball makes contact with each of the two *raceways* at two points. Under pure *axial load* on the bearing, each ball makes contact with each raceway at only one point. (Figures 10, 27.)

01.05.10
thrust ball bearing
A *thrust rolling bearing* with *balls* as *rolling elements*. (Figures 24 to 27.)

01.05.11
single row double-direction thrust ball bearing
A *four point contact ball bearing* having *contact angles* greater than 45°. (Figure 27.)

01.05.12
double row single-direction thrust ball bearing
A *single-direction thrust rolling bearing* having two concentric rows of *balls*, both supporting load in the same direction. (Figure 26.)

01.06 Roller bearings

01.06.01
roller bearing
A *rolling bearing* with *rollers* as *rolling elements*. (Figures 11 to 23, 28 to 32.)

01.06.02
radial roller bearing
A *radial rolling bearing* with *rollers* as *rolling elements*. (Figures 11 to 23.)

01.06.03
cylindrical roller (radial) bearing
A *radial rolling bearing* with *cylindrical rollers* as *rolling elements*. (Figures 11, 17 to 19.)

01.06.04
tapered roller (radial) bearing
A *radial rolling bearing* with *tapered rollers* as *rolling elements*. (Figures 12, 20, 21.)

01.06.05
needle roller (radial) bearing
A *radial rolling bearing* with *needle rollers* as *rolling elements*. (Figures 13, 14, 22, 23.)

01.06.06
drawn cup needle roller bearing
A *needle roller radial bearing* with a thin pressed steel outer ring (*drawn cup*), which may have one closed end or both ends open. Usually employed without inner ring. (Figure 14.)

01.06.07
convex roller (radial) bearing
A *radial rolling bearing* with *convex rollers* as *rolling elements*. (Figure 16.)

01.06.08
concave roller (radial) bearing
A *radial rolling bearing* with *concave rollers* as *rolling elements*. (Figure 15.)

01.06.09
spherical (radial) roller bearing
A *self-aligning, radial rolling bearing* with *convex rollers* or *concave rollers* as *rolling elements*. With convex rollers the *outer ring* has a *spherical raceway*, with concave rollers the *inner ring* has a spherical raceway. (Figures 15, 16.)

01.06.10
crossed roller bearing
An *angular contact rolling bearing* with one row of *rollers*, each roller positioned crosswise in relation to the adjacent rollers, such that an *axial load* in one direction is supported by half the *roller set* (every second roller) whilst an axial load in the opposite direction is carried by the other half of the roller set. (Figure 17.)

01.06.11
thrust roller bearing
A *thrust rolling bearing* with *rollers* as *rolling elements*. (Figures 28 to 31.)

01.06.12
cylindrical roller thrust bearing
A *thrust rolling bearing* with *cylindrical rollers* as *rolling elements*. (Figure 28.)

01.06.13
tapered roller thrust bearing
A *thrust rolling bearing* with *tapered rollers* as *rolling elements*. (Figure 29.)

01.06.14
needle roller thrust bearing
A *thrust rolling bearing* with *needle rollers* as *rolling elements*. (Figure 30.)

01.06.15
spherical thrust roller bearing
A *self-aligning, thrust rolling bearing* with *convex rollers* or *concave rollers* as *rolling elements*. With convex rollers the *housing washer* has a *spherical raceway*, with concave rollers the *shaft washer* has a spherical raceway. (Figure 31.)

02 Bearing parts

02.01 Bearing parts — General

02.01.01
(rolling) bearing part
One of the individual parts comprising a *rolling bearing* but excluding all accessories.

02.01.02
(rolling) bearing ring
An annular part of a *radial rolling bearing* incorporating one or more *raceways*. (Figures 34, 35.)

02.01.03
(rolling) bearing washer
An annular part of a *thrust rolling bearing* incorporating one or more *raceways*. (Figure 36.)

02.01.04
separable bearing ring [bearing washer]
A *bearing ring* [*bearing washer*] which may be independently and freely separated from a complete *rolling bearing*. (Figures 36, 40, 41.)

02.01.05
interchangeable bearing ring [bearing washer]
A *separable bearing ring* [*bearing washer*] which can be replaced by another ring [another washer] of a similar group without impairing the function of the bearing. (Figure 35.)

02.01.06
single-split bearing ring
A *bearing ring* which is split or fractured across its *raceway(s)*, in one place only, to facilitate manufacturing assembly. (Figure 37.)

02.01.07
double-split bearing ring
A *bearing ring* which is split or fractured across its *raceway(s)*, in two places, to facilitate manufacturing assembly and/or mounting. The two splits are generally diametrically opposite one another. (Figure 38.)

02.01.08
two-piece bearing ring [bearing washer]
A *bearing ring* [*bearing washer*] divided into two annular pieces in a plane perpendicular to its *axis*. Each piece incorporates at least part of a *raceway*. (Figure 39.)

02.01.09
loose rib
A separable basically flat washer the outer or inner part of which serves as an *inner ring rib* or *outer ring rib* for a *cylindrical roller radial bearing*. (Figure 40.)

02.01.10
(separate) thrust collar
A separable ring having an L-shaped section, the outer part of which serves as an *inner ring rib* for a *cylindrical roller radial bearing*. (Figure 41.)

02.01.11
guide ring
A separate ring in a *roller bearing* with two or more rows of *rollers*, used to separate the rows and to guide the rollers. (Figure 42.)

02.01.12
locating snap ring
A single-split ring of constant section, used in a *snap ring groove* to locate axially a *rolling bearing* in its *housing* or on its shaft. (Figure 34.)

02.01.13
retaining snap ring
A single-split ring of constant section, used in a *snap ring groove* to serve as a *rib* retaining the *rollers* or the *cage* (with *rolling elements*) in a *rolling bearing*.

02.01.14
(ring) spacer
An annular part used between two *bearing rings* or *bearing washers* or the two parts of a *two-piece bearing ring* or *two-piece bearing washer* to maintain a specified *axial distance* between them. (Figures 43, 56.)

02.01.15
(bearing) seal
A circular closure comprising one or several parts, affixed to one *bearing ring* or *bearing washer* and extending towards the other ring or washer, with which it makes contact or forms a narrow labyrinth-shaped gap, for the purpose of preventing leakage of lubricant or ingress of foreign substances. (Figure 44.)

02.01.16
(bearing) shield
A circular closure, usually of pressed sheet metal, affixed to one *bearing ring* or *bearing washer* and extending towards the other ring or washer, covering the interspace but not making contact with the other ring or washer. (Figure 45.)

02.01.17
flinger
A component part attached to an *inner ring* or *shaft washer* to supplement, by centrifugal action, the protection of a *rolling bearing* against ingress of foreign substances. (Figure 46.)

02.01.18
rolling element
A *ball* or *roller* which rolls between *raceways*. (Figures 34 to 36, 47, 62 to 69.)

02.01.19
(rolling bearing) cage
A *bearing part* which partly surrounds all or several of the *rolling elements* and moves with them. Its purpose is to space the rolling elements and generally also to guide and/or retain them in the bearing. (Figures 34 to 36, 70 to 76.)

02.01.20
(rolling element) separator
A *bearing part* which is placed between adjacent *rolling elements* and moves with them, the main purpose being to space the rolling elements. (Figure 47.)

02.02 Features of bearing parts — General

02.02.01
raceway
A surface of a load supporting part of a *rolling bearing*, suitably prepared as a rolling track for the *rolling elements*. (Figures 48 to 50.)

02.02.02
straight raceway
A *raceway* the generatrix of which, in a plane perpendicular to the direction of rolling, is a straight line. (Figure 49.)

02.02.03
crowned raceway
A basically cylindrical or conical *raceway* which has a continuous slightly convex curvature in a plane perpendicular to the direction of rolling to prevent stress concentration at the ends of contacts between *rollers* and the raceway.

02.02.04
spherical raceway
A *raceway* having the form of part of the surface of a sphere. (Figure 52.)

02.02.05
raceway groove
A *raceway* of a *ball bearing* in the form of a groove, generally with a cross-section of an arc of a circle with a radius slightly larger than half the *ball diameter*. (Figures 48, 60.)

02.02.06
(groove) shoulder
A flank of a *raceway groove*. (Figure 48.)

02.02.07
rib
A narrow ridge parallel to the direction of rolling, projecting from a *raceway* surface, generally for the purpose of supporting and/or guiding and/or retaining the *rolling elements* in a *rolling bearing*. (Figures 49, 50.)

02.02.08
cage riding land
A cylindrical surface of a *bearing ring* or a *bearing washer* intended to guide a *cage* radially. (Figures 49, 50.)

02.02.09
filling slot
A slot in a *rib* or a *shoulder* of a *bearing ring* or *bearing washer* to permit the insertion of *rolling elements*. (Figure 51.)

02.02.10
face (of a ring [a washer] [. . .])
A surface of a ring [a washer] [. . .] perpendicular to the axis of the ring [the washer] [. . .]. (Figures 48 to 52.)

02.02.11
bearing bore
The bore of the *inner ring* or *shaft washer* of a *rolling bearing*. (Figures 49 to 51, 60.)

02.02.12
cylindrical bore
A *bearing bore* or a bore of a *bearing part* whose generatrix is a basically straight line parallel to the *bearing axis* or the axis of the bearing part. (Figures 49, 51.)

02.02.13
tapered bore
A *bearing bore* or a bore of a *bearing part* whose generatrix is a basically straight line intersecting the *bearing axis* or the axis of the bearing part. (Figure 50.)

02.02.14
bearing outside surface
The outside surface of the *outer ring* or the *housing washer* of a *rolling bearing*. (Figures 48, 51, 52, 60.)

02.02.15
ring [washer] chamfer
A surface of a *bearing ring* [*bearing washer*] joining the bore or outside surface with one of the *faces* of the ring [the washer]. (Figures 48, 49, 52.)

02.02.16
grinding undercut
A groove or slot at the root of a *rib* or flange of a *bearing ring* or *bearing washer* to facilitate grinding. (Figures 49, 50.)

02.02.17
sealing (contact) surface
A surface with which a seal is intended to make sliding contact. (Figure 44.)

02.02.18
seal [shield] groove
A groove intended for the retention of a *bearing seal* [*bearing shield*]. (Figures 44, 45.)

02.02.19
snap ring groove
A groove to accommodate a *locating snap ring* or a *retaining snap ring*. (Figure 48.)

02.02.20
lubrication groove
A groove in a *bearing part* for conveying lubricant. (Figures 42, 43.)

02.02.21
lubrication hole
A hole in a *bearing part* for conveying lubricant to the *rolling elements*. (Figures 42, 43.)

02.03 Bearing rings

02.03.01
(bearing) inner ring
A *bearing ring* incorporating the *raceway(s)* on its outside surface. (Figures 34, 49.)

02.03.02
(bearing) outer ring
A *bearing ring* incorporating the *raceway(s)* on its inside surface. (Figures 34, 48.)

02.03.03
(bearing) cone
An *inner ring* of a *tapered roller bearing*. (Figures 35, 54, 56.)

02.03.04
(bearing) cup
An *outer ring* of a *tapered roller bearing*. (Figures 35, 54.)

02.03.05
double cone
A *bearing cone* having two *raceways*. (Figure 43.)

02.03.06
double cup
A *bearing cup* having two *raceways*. (Figure 56.)

02.03.07
extended inner ring
A *bearing inner ring* extended on one or both sides in order to improve the guidance of a shaft in its bore and/or to permit the fixing of a locking device and/or to provide additional space for sealing devices. (Figure 46.)

02.03.08
stepped inner ring
An *inner ring* of a *groove ball bearing* with one *shoulder* completely or partly removed. (Figure 53.)

02.03.09
counterbored outer ring
An *outer ring* of a *groove ball bearing* with one *shoulder* completely or partly removed. (Figure 53.)

02.03.10
(bearing) drawn cup
A *bearing outer ring*, commonly of a *needle roller radial bearing*, made of sheet metal drawn to shape with one end closed (closed end drawn cup) or both ends open. (Figure 57.)

02.03.11
flanged outer ring
A *bearing outer ring* with a flange (*outer ring flange*). (Figure 55.)

02.03.12
aligning outer ring
A *bearing outer ring* having a *spherical outside surface* to accommodate permanent angular misalignment between its *axis* and the axis of its *housing*. (Figure 58.)

02.03.13
aligning housing ring
A ring used between an *aligning outer ring* and a *housing* bore, having a spherical inside surface matching the *spherical outside surface* of the outer ring. (Figure 58.)

02.03.14
spherical outside surface
An outside surface, for example of a *bearing outer ring*, having the form of part of the surface of a sphere. (Figures 46, 58.)

02.03.15
back face (of a bearing ring)
That *face* of a *bearing ring* which is intended to support *axial load*. (Figures 53, 54.)

02.03.16
front face (of a bearing ring)
That *face* of a *bearing ring* which is not intended to support *axial load*. (Figures 53, 54.)

02.03.17
outer ring flange
A flange on the outside of a *bearing outer ring* for the purposes of axially locating the bearing in its *housing* and to support *axial load*. (Figure 55.)

02.03.18
(outer ring) flange back face
That side of an *outer ring flange* which is intended to support *axial load*. (Figure 55.)

02.03.19
cone back face rib
A *rib* on the *back face* side of the *raceway* of a *cone*, intended to guide the *rollers* and support *roller large end face* thrust. (Figure 54.)

02.03.20
cone front face rib
A *rib* on the *front face* side of the *raceway* of a *cone*, intended to retain the *rollers* and, in the case of a bearing with a *cup front face rib*, to support *roller small end face* thrust. (Figures 54, 59.)

02.03.21
cup front face rib
A *rib* on the *front face* side of the *raceway* of a *cup*, intended to guide the *rollers* and support *roller large end face* thrust. (Figure 59.)

02.03.22
centre rib
A central integral *rib* of a *bearing ring* with two *raceways*, for example, a *double cone*. (Figure 50.)

02.03.23
inner ring back face [front face] chamfer
A surface joining the *back face* [*front face*] of a *bearing inner ring* with the bore of the ring. (Figures 53, 56.)

02.03.24
outer ring back face [front face] chamfer
A surface joining the *back face* [*front face*] of a *bearing outer ring* with the outside surface of the ring. (Figures 53, 56.)

02.04 Bearing washers

02.04.01
shaft washer
A *bearing washer* which is intended to be mounted on a shaft. (Figures 36, 60.)

02.04.02
housing washer
A *bearing washer* which is intended to be mounted in a *housing*. (Figures 36, 52, 60.)

02.04.03
central washer
A *bearing washer* having a *raceway* on each *face*, used between the two rows of *rolling elements* of a *double row, double-direction thrust rolling bearing* (Figure 61.)

02.04.04
aligning housing washer
A *housing washer* having a *spherical back face* to accommodate permanent angular misalignment between its *axis* and the axis of its *housing*. (Figure 61.)

02.04.05
aligning seat washer
A washer used between an *aligning housing washer* and the thrust supporting surface of a *housing*, one *face* of which has a concave spherical surface matching the *spherical back face* of the aligning housing washer. (Figure 61.)

02.04.06
spherical back face
A *housing washer back face* which, or a zone of which, is convex with a spherical form. (Figure 61.)

02.04.07
shaft washer [housing washer] back face
A *face* of a *shaft washer* [a *housing washer*] intended to support *axial load*, generally opposite a *raceway* face. (Figures 52, 60.)

02.04.08
shaft washer back face chamfer
A surface joining the *shaft washer back face* with the bore of the washer. (Figure 60.)

02.04.09
housing washer back face chamfer
A surface joining the *housing washer back face* with the outside surface of the washer. (Figures 52, 60.)

02.05 Rolling elements

02.05.01
ball
A spherical *rolling element*.

02.05.02
roller
A *rolling element* having an axis of symmetry and being circular in cross-section in any plane perpendicular to that axis. (Figures 62 to 69.)

02.05.03
ball [roller] complement
All of the *balls* [the *rollers*] in a particular *rolling bearing*.

02.05.04
ball [roller] set
The *balls* [*rollers*] in one row of a *rolling bearing*.

02.05.05
cylindrical roller
A *roller* the generatrix of the outside surface of which is a basically straight line parallel with the roller axis. (Figures 62, 68.)

02.05.06
needle roller
A *cylindrical roller* of small diameter with a large ratio of length to diameter. It is generally accepted that the length is between three and ten times the diameter, which does not usually exceed 5 mm. The ends of a needle roller may be one of several shapes. (Figure 63.)

02.05.07
tapered roller
A *roller* the generatrix of the outside surface of which is a basically straight line intersecting the roller axis. The general shape is that of a truncated cone. (Figure 64.)

02.05.08
convex roller
A *roller* the outside surface of which has a convex curvature in a plane containing its axis. (Figures 66, 67.)

02.05.09
concave roller
A *roller* the outside surface of which has a concave curvature in a plane containing its axis. (Figure 65.)

02.05.10
convex symmetrical roller
A *convex roller* the outside surface of which is symmetrical about the plane perpendicular to the roller axis through the middle of the roller. (Figure 66.)

02.05.11
convex asymmetrical roller
A *convex roller* the outside surface of which is asymmetrical about the plane perpendicular to the roller axis through the middle of the roller. (Figure 67.)

02.05.12
crowned roller
A basically *cylindrical roller* or basically *tapered roller* the outside surface of which has a continuous slightly convex curvature in a plane containing the roller axis to prevent stress concentration at the ends of the contacts between the roller and the *raceways*.

02.05.13
relieved end roller
A *roller* with a slight modification of diameter at the ends of its outside surface to prevent stress concentration at the ends of the contacts between the roller and the *raceways*. (Figure 68.)

02.05.14
spiral wound roller
A *roller* made by winding steel strip in helical form. (Figure 69.)

02.05.15
roller end face
A surface at the end of a *roller*, basically perpendicular to the roller axis. (Figure 62.)

02.05.16
roller large end face
The *face* at the large end of a *tapered roller* or a *convex asymmetrical roller*. (Figures 64, 67.)

02.05.17
roller small end face
The *face* at the small end of a *tapered roller* or a *convex asymmetrical roller*. (Figures 64, 67.)

02.05.18
roller recess
An indentation, dimple or undercut about the centre of a *roller end face*. (Figure 64.)

02.05.19
roller chamfer
A surface joining the outside surface of a *roller* with one of the *roller end faces*. (Figures 62, 64, 67.)

02.06 Cages

02.06.01
ribbon cage
A *rolling bearing cage* comprising one or two corrugated annular parts. (Figure 70.)

02.06.02
snap cage
A *rolling bearing cage* with *cage prongs* the form of which permits the assembling of the cage with the *rolling elements* by elastic deformation. (Figure 71.)

02.06.03
window type cage
A one-piece *rolling bearing cage* having *cage pockets* surrounding the *rolling elements*. (Figure 72.)

02.06.04
prong type cage
A one-piece *rolling bearing cage* with *cage prongs*. (Figure 73.)

02.06.05
pin type cage
A *two-piece cage* with *cage pins* joining the two cage parts together. (Figure 74.)

02.06.06
two-piece cage
A *rolling bearing cage* comprising two annular parts joined together, generally by rivets, *cage pins* or *cage stays*. (Figures 70, 75, 76.)

02.06.07
double-split cage
A *rolling bearing cage* which is split in two places to facilitate assembly. The two splits are generally diametrically opposite one another.

02.06.08
cage pocket
An aperture or gap in a *rolling bearing cage* to accommodate one or more *rolling elements*. (Figures 70 to 73, 75, 76.)

02.06.09
cage bar
A portion of a *rolling bearing cage* separating adjacent *cage pockets*. (Figures 72, 75.)

02.06.10
cage prong
A cantilever *cage bar* projecting from the annular body of a *rolling bearing cage*.or from one part of a *two-piece cage*. (Figures 71, 73.)

02.06.11
cage pin
A *cage stay* which is basically cylindrical and may pass through an axial hole in a *roller*. (Figure 74.)

02.06.12
cage stay
One of several parts used to join the two annular parts of a *two-piece cage* together and to maintain them at a specified distance from each other. (Figure 76.)

02.06.13
land riding cage
A *rolling bearing cage* radially guided (centred) by a land on a *bearing ring* or *bearing washer (cage riding land)*.

03 Bearing arrangement and sub-units

03.01 Bearing arrangements

03.01.01
paired mounting
An arrangement of two *rolling bearings* mounted side-by-side on the same shaft such that they operate as a unit. The bearings may be mounted in *back-to-back*, *face-to-face* or *tandem arrangement*. (Figures 77 to 79.)

03.01.02
stack mounting
An arrangement of three or more *rolling bearings* mounted side-by-side on the same shaft such that they operate as a unit. (Figure 80.)

03.01.03
back-to-back arrangement
An arrangement of two *rolling bearings* mounted side-by-side with the *back faces* of their *outer rings* adjacent. (Figure 77.)

03.01.04
face-to-face arrangement
An arrangement of two *rolling bearings* mounted side-by-side with the *front faces* of their *outer rings* adjacent. (Figure 78.)

03.01.05
tandem arrangement
An arrangement of two or more *rolling bearings* mounted side-by-side with the *back face* of the *outer ring* of one bearing adjacent to the *front face* of the outer ring of the next bearing. (Figure 79.)

03.01.06
matched pair
Two *rolling bearings* which have been selected or manufactured to have predetermined characteristics, usually preload or clearance, when mounted together in a specified way.

03.01.07
matched stack
Three or more *rolling bearings* which have been selected or manufactured to have predetermined characteristics, usually preload or clearance, when mounted together in a specified way.

03.02 Sub-units

03.02.01
sub-unit
A *bearing ring* or *bearing washer*, with or without *rolling elements* or with *cage* and rolling elements, which can be freely separated from the bearing. A *rolling element and cage assembly* which can be freely separated from the bearing. (Figures 81 to 92.)

03.02.02
interchangeable sub-unit
A *sub-unit* which can be replaced by another sub-unit of a similar group without impairing the function of the *bearing*.

03.02.03
inner ring, cage and ball [roller] assembly
A *sub-unit* consisting of an *inner ring*, *balls* [*rollers*] and *cage*. (Figures 81, 82.)

03.02.04
cone assembly
A *sub-unit* consisting of a *bearing cone*, *tapered rollers* and a *cage*. (Figure 83.)

03.02.05
outer ring, cage and ball [roller] assembly
A *sub-unit* consisting of an *outer ring*, *balls* [*rollers*] and *cage*. (See also 03.02.06.) (Figures 84, 85.)

03.02.06
needle roller bearing without inner ring
An assembly consisting of an *outer ring* and *needle rollers* of a *full complement bearing* or an outer ring with needle rollers and *cage*. As required, additional description of the bearing can be included in the term, for example "needle-roller bearing, full complement, drawn cup, without inner ring" or "needle roller bearing, with cage, machined ring, without inner ring". (Figures 86, 87.)

03.03 Rolling element and cage assemblies

03.03.01
rolling element and cage assembly
A *sub-unit* consisting of *rolling elements* and *cage* of a *rolling bearing*. (Figures 88 to 92.)

03.03.02
ball [roller] and cage assembly
A *sub-unit* consisting of *rolling elements* and *cage* of a *ball* [a *roller*] *bearing*. Used when there is no need to specify whether the assembly is for a *radial bearing* or a *thrust bearing*. (Figures 88 to 92.)

03.03.03
ball and cage radial [thrust] assembly
A *ball and cage assembly* of a *radial* [a *thrust*] *ball bearing*. (Figures 88, 89.)

03.03.04
roller and cage radial [thrust] assembly
A *roller and cage assembly* of a *radial* [a *thrust*] *roller bearing*. As required, a description of the type of roller can be added to the term, for example "needle roller and cage thrust assembly" or "cylindrical roller and cage radial assembly". (Figures 90 to 92.)

04 Dimensions

04.01 Dimension plans and series

04.01.01
dimension plan
A system or table covering the *boundary dimensions* of *rolling bearings*.

04.01.02
bearing series
A group of *rolling bearings* of a specific type, with gradually increasing dimensions and in most cases with the same *contact angle* and a certain relationship between *boundary dimensions*.

04.01.03
dimension series
A combination of a *width series* or a *height series* with a *diameter series* and, for *tapered roller bearings*, an *angle series*.

04.01.04
diameter series
Part of the ISO *dimension plans*. A progressive series of *bearing outside diameters*, one for each standard *bearing bore diameter*, often with a specific relationship between the two diameters.

04.01.05
width series
Part of the ISO *dimension plans* for *radial bearings*. A progressive series of *bearing widths*, one for each *bearing bore diameter* of each *diameter series*.

04.01.06
height series
Part of the ISO *dimension plans* for *thrust bearings*. A progressive series of *bearing heights*, one for each *bearing bore diameter* of each *diameter series*.

04.01.07
angle series
Part of the ISO *dimension plans* for *tapered roller bearings*. A specified range of *contact angles*.

04.02 Axes, planes, directions

04.02.01
bearing axis
The theoretical axis of rotation of a *rolling bearing*. For a *radial bearing* this is the *inner ring axis* and for a *thrust bearing* the *shaft washer axis*.

04.02.02
inner ring [shaft washer] axis
The axis of the cylinder or cone inscribed in the basically cylindrical or tapered bore of an *inner ring* [a *shaft washer*].

04.02.03
outer ring [housing washer] axis
The axis of the cylinder circumscribed around the outside surface of an *outer ring* [a *housing washer*], if this surface is basically cylindrical, or the line perpendicular to the *reference face* of an outer ring, through the centre of the sphere circumscribed around the outside surface of the ring, if this surface is basically spherical.

04.02.04
(bearing) cone [cup] axis
The *inner ring axis* [*outer ring axis*] of a *tapered roller bearing*.

04.02.05
radial plane
A plane perpendicular to an axis. For a *bearing ring* or a *bearing washer* it is, however, generally acceptable to consider a radial plane as being parallel with the plane tangential to the *reference face* of the ring or the *back face* of the washer.

04.02.06
radial direction
Direction through an axis and in a *radial plane*.

04.02.07
axial plane
A plane containing an axis.

04.02.08
axial direction
Direction parallel with an axis. For a *bearing ring* or a *bearing washer* it is, however, generally acceptable to consider an axial direction as being perpendicular to the plane tangential to the *reference face* of the ring or the *back face* of the washer.

04.02.09
radial [axial] distance
A distance measured in a *radial* [an *axial*] *direction*.

04.02.10
contact angle [nominal contact angle]
The angle between a plane perpendicular to a *bearing axis* (a *radial plane*) and the line of action [the nominal line of action] of the resultant of the forces transmitted by a *bearing ring* or *washer* to a *rolling element*. (See also 04.04.04.) (Figures 93, 94.)

04.02.11
load centre
The point at which the resultants of the forces transmitted by a *bearing ring* or *washer* to the *rolling elements* in one row intersect the *bearing axis*. (This applies only if the *contact angle* is less than 90° and equal for all the rolling elements.) (Figures 93, 94.)

04.02.12
nominal contact point
Point on a *raceway* surface where a *rolling element* is intended to make contact when the bearing parts are in normal relative positions. (Figures 93, 94.)

04.02.13
reference face of a ring [a washer]
A *face of a ring* [a *washer*] designated as reference face by the manufacturer of the bearing and which may be the datum for measurements.

04.03 Boundary dimensions

04.03.01
(bearing) boundary dimension
One of the dimensions defining the boundaries of a *bearing*. The principal boundary dimensions are the bore diameter, the outside diameter, the width (or height) and the chamfer dimensions.

04.03.02
bearing bore diameter
The *inner ring* bore diameter of a *radial bearing* or the *shaft washer* bore diameter of a *thrust bearing*. (See also 05.01.01, 05.01.02 and 05.01.05.) (Figures 93, 94, 96.)

04.03.03
bearing outside diameter
The *outer ring* outside diameter of a *radial bearing* or the *housing washer* outside diameter of a *thrust bearing*. (See also 05.01.01, 05.01.02 and 05.01.05.) (Figures 93, 94, 96.)

04.03.04
bearing width
The *axial distance* between the two *ring faces* designated to bound the width of a *radial bearing*. For a *single row tapered roller bearing* this is the axial distance between the *back face* of the *cup* and that of the *cone*. (See also 05.02.06 and 05.02.07.) (Figures 93, 94.)

04.03.05
bearing height
The *axial distance* between the two *washer back faces* designated to bound the height of a *thrust bearing*. (See also 05.02.06 and 05.02.09.) (Figure 96.)

04.03.06
ring [washer] chamfer dimension
Extension in a *radial* or *axial direction* of the surface of a *ring* [a *washer*] *chamfer*. (See also 04.03.07, 04.03.08, 05.03.01, 05.03.02 and 05.03.03.) (Figure 93.)

04.03.07
radial chamfer dimension
The distance between the imaginary sharp corner of a *ring* or *washer* and the intersection of a chamfer surface and the *face* of the ring or washer. (See also 05.03.02.) (Figure 93.)

04.03.08
axial chamfer dimension
The distance between the imaginary sharp corner of a *ring* or *washer* and the intersection of a chamfer surface and the bore or outside surface of the ring or washer. (See also 05.03.03.) (Figure 93.)

04.03.09
flange width
The *axial distance* between the *faces* of a flange. (Figure 95.)

04.03.10
flange height
The radial dimension of a flange. For an *outer ring flange* this is the *radial distance* between its outside surface and the outside surface of the outer ring. (Figure 95.)

04.03.11
snap ring groove diameter
The diameter of the cylindrical surface of a *snap ring groove*. (Figure 97.)

04.03.12
snap ring groove width
The *axial distance* between the *faces* of a *snap ring groove*. (Figure 97.)

04.03.13
snap ring groove depth
The *radial distance* between the cylindrical surface of a *snap ring groove* and the cylindrical surface in which the groove is machined. (Figure 97.)

04.03.14
aligning surface radius
The radius of curvature of the spherical surface of an *aligning housing washer, aligning seat washer, aligning outer ring* or *aligning housing ring*. (Figure 96.)

04.03.15
aligning surface centre height
The *axial distance* between the centre of curvature of the *spherical back face* of an *aligning housing washer* and the opposite *shaft washer back face* of a *thrust bearing*. (Figure 96.)

04.04 Dimensions of sub-units and parts

04.04.01
raceway contact diameter
The diameter of the circle through the *nominal contact points* on a *raceway*. (Figures 93, 94.)

04.04.02
middle of raceway
Point or line on a *raceway* surface, halfway between the two edges of the raceway.

04.04.03
cup small inside diameter
The diameter of the imaginary circle of intersection of the *back face* of a *cup* and the cone inscribed in the cup, tangential to its *raceway* at the *nominal contact points*. (Figure 95.)

04.04.04
cup angle
The angle included between two lines tangential to the *raceway* of a *cup* at the *nominal contact points* and in a plane containing the *cup axis*. For a cup without *front face rib* this is equal to twice the *contact angle* of the bearing. (Figure 94.)

04.04.05
ring width

The *axial distance* between the two side *faces* of a *rolling bearing ring*. (See also 05.02.01, 05.02.02 and 05.02.05.) (Figures 93, 94.)

04.04.06
washer height
The *axial distance* between the two outermost *faces* of a *rolling bearing washer*. (Figure 96.)

04.04.07
ball diameter
The distance between two parallel planes tangential to the surface of a *ball*. (See also 05.04.01, 05.04.02 and 05.04.03.)

04.04.08
roller diameter
The distance between two tangents to the surface of a *roller*, parallel to each other and in a plane perpendicular to the roller axis (a *radial plane*). For the calculation of *load ratings* the radial plane at the middle of the roller applies. (See also 05.05.01, 05.05.02 and 05.05.03.)

04.04.09
roller length
The distance between the two *radial planes* which just contain the extremities of a *roller*. For the calculation of *load ratings*, however, the applicable "roller length" is the theoretical maximum length of contact between a roller and that *raceway* where the contact is the shortest. (See also 05.05.05 and 05.05.06.)

04.04.10
pitch diameter of ball set
The diameter of the circle containing the centres of the *balls* in one row in a *bearing*. (Figure 97.)

04.04.11
pitch diameter of roller set
The diameter of the circle intersecting the roller axes at the middle of the *rollers* in one row in a *bearing*. (Figures 95, 98.)

04.04.12
ball set bore diameter [outside diameter]
The diameter of the cylinder inscribed inside [circumscribed around] one row of *balls* in a *bearing*. (Figure 97.)

04.04.13
roller set bore diameter [outside diameter]
The diameter of the cylinder inscribed inside [circumscribed around] one row of *rollers* in a *radial contact roller bearing*.

04.04.14
ball complement bore diameter [outside diameter]
The diameter of the cylinder inscribed inside [circumscribed around] all of the *balls* in a *radial ball bearing*.

04.04.15
roller complement bore diameter [outside diameter]
The diameter of the cylinder inscribed inside [circumscribed around] all of the *rollers* in a *radial contact roller bearing*. (Figure 98.)

04.04.16
bore diameter of a ball [roller] and cage radial assembly
The theoretical *ball [roller] complement bore diameter* of a *ball [roller] and cage radial assembly.* (Figure 99

04.04.17
outside diameter of a ball [roller] and cage radial assembly
The theoretical *ball [roller] complement outside diameter* of a *ball [roller] and cage radial assembly.* (Figure 99.)

04.04.18
bore diameter of a ball [roller] and cage thrust assembly
The bore diameter of the *cage* of a *ball [roller] and cage thrust assembly.* (Figure 100.)

04.04.19
outside diameter of a ball [roller] and cage thrust assembly
The outside diameter of the *cage* of a *ball [roller] and cage thrust assembly.* (Figure 100.)

05 Dimensions associated with tolerances

05.01 Bore diameter and outside diameter

05.01.01
nominal bore diameter [outside diameter]
The diameter of the cylinder containing the theoretical surface of a basically cylindrical bore [cylindrical outside surface]. The diameter, in a designated *radial plane*, of the cone containing the theoretical surface of a basically tapered bore. The diameter of the sphere containing the theoretical surface of a basically spherical outside surface.

NOTE — For rolling bearings, the nominal bore and outside diameters are generally the reference values (basic diameters) for the deviations of the actual bore and outside surfaces.

05.01.02
single bore diameter [outside diameter]
The distance between two parallel tangents to the line of intersection of the actual bore surface [outside surface] and a *radial plane.*

05.01.03
deviation of a single bore diameter [outside diameter]
The difference between a *single bore diameter [outside diameter]* and the *nominal bore diameter [outside diameter]* of a basically cylindrical bore [outside surface].

05.01.04
bore diameter [outside diameter] variation
The difference between the largest and the smallest of the *single bore diameters [single outside diameters]* of an individual *ring* or *washer* with a basically cylindrical bore [outside surface].

05.01.05
mean bore diameter [outside diameter]
The arithmetical mean of the largest and the smallest of the *single bore diameters [single outside diameters]* of an individual *ring* or *washer* with a basically cylindrical bore [outside surface].

05.01.06
mean bore diameter [outside diameter] deviation
The difference between the *mean bore diameter [mean outside diameter]* and the *nominal bore diameter [outside diameter].*

05.01.07
single plane mean bore diameter [outside diameter]
The arithmetical mean of the largest and the smallest of the *single bore diameters [single outside diameters]* in a single *radial plane.*

05.01.08
single plane mean bore diameter [outside diameter] deviation
The difference between a *single plane mean bore diameter [mean outside diameter]* and the *nominal bore diameter [outside diameter]* of a basically cylindrical bore [outside surface].

05.01.09
bore diameter [outside diameter] variation in a single radial plane
The difference between the largest and the smallest of the *single bore diameters [single outside diameters]* in a single *radial plane.*

05.01.10
mean bore diameter [outside diameter] variation
The difference between the largest and the smallest of the *single plane mean bore diameters [mean outside diameters]* of an individual *ring* or *washer* with a basically cylindrical bore [outside surface].

05.02 Width and height

05.02.01
nominal ring width
The distance between the two theoretical side *faces* of a *bearing ring.*

NOTE — For rolling bearing rings, the nominal width is generally the reference value (basic dimension) for deviations of the actual width.

05.02.02
single ring width
The distance between the points of intersection of the two actual side *faces* of a *bearing ring* and a straight line perpendicular to the plane tangential to the *reference face* of the ring.

05.02.03
deviation of a single ring width
The difference between a *single ring width* and the *nominal ring width*.

05.02.04
ring width variation
The difference between the largest and the smallest of the *single ring widths* of an individual ring.

05.02.05
mean ring width
The arithmetical mean of the largest and the smallest of the *single ring widths* of an individual ring.

05.02.06
nominal bearing width [bearing height]
The distance between the two theoretical *ring faces* [*washer back faces*] designated to bound the width of a *radial bearing* [the height of a *thrust bearing*].

NOTE — The nominal bearing width or bearing height is generally the reference value (basic dimension) for deviations of the actual bearing width or bearing height.

05.02.07
actual bearing width
The distance between the points of intersection of the *bearing axis* and the two planes tangential to the actual ring *faces* designated to bound the width of a *radial bearing* where one *inner ring* face and one *outer ring* face are designated to bound the width.

NOTE — For a *single row tapered roller bearing*, this is the distance between the points of intersection of the bearing axis and two planes, one tangential to the actual *back face* of the *cone* and one tangential to that of the *cup*, the cone and cup *raceways* and the *cone back face rib* being in contact with all the *rollers*.

05.02.08
deviation of the actual bearing width
The difference between the *actual bearing width* and the *nominal bearing width* of a *radial bearing*.

05.02.09
actual bearing height
The distance between the points of intersection of the *bearing axis* and the two planes tangential to the actual *washer back faces* designated to bound the height of a *thrust bearing*.

05.02.10
deviation of the actual bearing height
The difference between the *actual bearing height* and the *nominal bearing height* of a *thrust bearing*.

05.03 Chamfer dimensions

05.03.01
nominal chamfer dimension
Chamfer dimension value used for reference purposes.

NOTE — Replaced by the *smallest permissible single chamfer dimension* for reference purposes in ISO International Standards published after 1974.

05.03.02
radial single chamfer dimension
The actual distance, in a single *axial plane*, between the imaginary sharp corner of a *ring* or *washer* and the intersection of a *chamfer* surface and the *face* of the ring or washer.

05.03.03
axial single chamfer dimension
The actual distance, in a single *axial plane*, between the imaginary sharp corner of a *ring* or *washer* and the intersection of a *chamfer* surface and the bore or outside surface of the ring or washer.

05.03.04
smallest permissible single chamfer dimension
The smallest permissible *radial* and *axial single chamfer dimensions* of a *ring* or *washer* and, in addition, the radius of an imaginary circular arc, in an *axial plane*, tangential to the ring or washer *face* and to the bore or outside surface of the ring or washer, beyond which no ring or washer material is allowed to project.

05.03.05
largest permissible single chamfer dimension
The largest permissible *radial* or *axial single chamfer dimension*.

05.04 Ball dimensions

05.04.01
nominal ball diameter
The diameter value which is used for the general identification of a *ball* size.

05.04.02
single diameter of a ball
The distance between two parallel planes tangential to the actual surface of a *ball*.

05.04.03
mean diameter of a ball
The arithmetical mean of the largest and the smallest of the *single diameters of a ball*.

05.04.04
ball diameter variation
The difference between the largest and the smallest of the *single diameters of a ball*.

05.04.05
ball lot
A definite quantity of *balls* manufactured under conditions presumed uniform and which is considered as an entity.

05.04.06
(ball) lot mean diameter
The arithmetical mean of the *mean diameters* of the largest *ball* and the smallest in a *ball lot*.

05.04.07
(ball) lot diameter variation
The difference between the *mean diameters* of the largest *ball* and the smallest in a *ball lot*.

05.04.08
ball grade
A specific combination of dimensional, form, surface roughness and sorting tolerances for *balls*.

05.04.09
ball gauge
The amount by which the *ball lot mean diameter* should differ from the *nominal ball diameter*, this amount being one of an established series.

05.04.10
(lot) deviation from ball gauge
The difference between the *ball lot mean diameter* and the sum of the *nominal ball diameter* and the *ball gauge*.

05.04.11
ball subgauge
The amount, of an established series of amounts, which is the nearest to the actual *deviation from ball gauge* of a *ball lot*.

05.05 Roller dimensions

05.05.01
nominal diameter of a roller
The diameter value used for the general identification of *roller diameter*. For a symmetrical roller this is the theoretical diameter in a *radial plane* through the middle of the *roller length* and for an asymmetrical roller it is the largest theoretical diameter (i.e. in a radial plane at the imaginary sharp large end corner of a *tapered roller*).

05.05.02
single diameter of a roller
The distance between two tangents to the actual surface of a *roller* parallel to each other and in a plane perpendicular to the roller axis (a *radial plane*).

05.05.03
single plane mean roller diameter
The arithmetical mean of the largest and the smallest of the *single diameters of a roller* in a single *radial plane*.

05.05.04
single plane roller diameter variation
The difference between the largest and the smallest of the *single diameters of a roller* in a single *radial plane*.

05.05.05
nominal length of a roller
The length value used for the general identification of *roller length*.

05.05.06
actual length of a roller
The distance between the two *radial planes* which just contain the actual extremities of a *roller*.

05.05.07
roller gauge
A diameter deviation range limited by a high and a low deviation of the *single plane mean roller diameter* from the *nominal diameter of a roller* in the same specified *radial plane*. For *cylindrical rollers* and *needle rollers* the plane through the middle of the *roller length* applies.

05.05.08
(roller) gauge lot
A quantity of rollers, of the same *roller grade* and nominal dimensions, all having a *single plane mean roller diameter* within the same *roller gauge*.

05.05.09
(roller) gauge lot diameter variation
The difference between the *single plane mean diameter* of the *roller* having the largest such diameter and that of the roller having the smallest such diameter in a *roller gauge lot*.

05.05.10
roller grade
A specific combination of diameter and form tolerances for *rollers*.

05.06 Form

05.06.01
deviation from circular form (of a basically circular line on a surface)
Greatest *radial distance* between the circle inscribed in the line (inside surface) or circumscribed around the line (outside surface) and any point on the line.

05.06.02
deviation from cylindrical form (of a basically cylindrical surface)
Greatest *radial distance* in any *radial plane*, between the cylinder inscribed in the surface (inside surface) or circumscribed around the surface (outside surface) and any point on the surface.

05.06.03
deviation from spherical form (of a basically spherical surface)
Greatest *radial distance*, in any equatorial plane, between the sphere inscribed in the surface (inside surface) or circumscribed around the surface (outside surface) and any point on the surface.

05.07 Running accuracy

05.07.01
radial runout of assembled bearing inner ring (radial bearing)
Difference between the largest and the smallest of the *radial distances* between the bore surface of the *inner ring*, in different angular positions of this ring, and a point in a fixed position relative to the *outer ring*. At the angular position of the point mentioned, or on each side and close to it, *rolling elements* are to be in contact with both the inner and outer ring *raceways* and (in a *tapered roller bearing*) the *cone back face rib*, the bearing parts being otherwise in normal relative positions.

05.07.02

radial runout of assembled bearing outer ring (radial bearing)

Difference between the largest and the smallest of the *radial distances* between the outside surface of the *outer ring*, in different angular positions of this ring, and a point in a fixed position relative to the *inner ring*. At the angular position of the point mentioned, or on each side and close to it, *rolling elements* are to be in contact with both the inner and outer ring raceways and (in a *tapered roller bearing*) the *cone back face rib*, the bearing parts being otherwise in normal relative positions.

05.07.03

assembled bearing inner ring face runout with raceway (groove ball bearing)

Difference between the largest and the smallest of the *axial distances* between the *reference face* of the *inner ring*, in different relative angular positions of this ring, at a *radial distance* from the *inner ring axis* equal to half the inner ring *raceway contact diameter*, and a point in a fixed position relative to the *outer ring*. The inner and outer ring *raceways* are to be in contact with all the *balls*.

05.07.04

assembled bearing cone back face runout with raceway (tapered roller bearing)

Difference between the largest and the smallest of the *axial distances* between the *cone back face*, in different angular positions of the cone, at a *radial distance* from the *cone axis* equal to half the cone *raceway contact diameter*, and a point in a fixed position relative to the *cup*. The cone and cup *raceways* and the *cone back face rib* are to be in contact with all the *rollers*, the bearing parts being otherwise in normal relative positions.

05.07.05

assembled bearing outer ring face runout with raceway (groove ball bearing)

Difference between the largest and the smallest of the *axial distances* between the *reference face* of the *outer ring*, in different relative angular positions of this ring, at a *radial distance* from the *outer ring axis* equal to half the outer ring *raceway contact diameter*, and a point in a fixed position relative to the *inner ring*. The inner and outer ring *raceway* are to be in contact with all the *balls*.

05.07.06

assembled bearing cup back face runout with raceway (tapered roller bearing)

Difference between the largest and the smallest of the *axial distances* between the *cup back face*, in different angular positions of the cup, at a *radial distance* from the *cup axis* equal to half the cup *raceway contact diameter*, and a point in a fixed position relative to the *cone*. The cone and cup *raceways* and the *cone back face rib* are to be in contact with all the *rollers*, the bearing parts being otherwise in normal relative positions.

05.07.07

face runout with bore (inner ring, reference face)

Difference between the largest and the smallest of the *axial distances* between a plane perpendicular to the *ring axis* and the *reference face* of the ring, at a *radial distance* from the axis of half the *inner ring raceway contact diameter*.

05.07.08

raceway parallelism with face (inner or outer ring of groove ball bearing, reference face)

Difference between the largest and the smallest of the *axial distances* between the plane tangential to the *reference face* and the *middle of the raceway*.

05.07.09

variation of outside surface generatrix inclination with face (outer ring basically cylindrical surface, reference face)

Total variation of the relative position, in a *radial direction* parallel with the plane tangential to the *reference face* of the *outer ring*, of points on the same generatrix of the outside surface at a distance from the side *faces* of the ring equal to the largest permissible *axial single chamfer dimension*.

05.07.10

inner ring raceway to bore thickness variation (radial bearing)

Difference between the largest and the smallest of the *radial distances* between the bore surface and the *middle of a raceway* on the outside of the *inner ring*.

05.07.11

outer ring raceway to outside surface thickness variation (radial bearing)

Difference between the largest and the smallest of the *radial distances* between the outside surface and the *middle of a raceway* on the inside of the *outer ring*.

05.07.12

washer raceway to back face thickness variation (thrust bearing shaft or housing washer, flat back face)

Difference between the largest and the smallest of the *axial distances* between the *back face* and the *middle of a raceway* on the opposite side of the *washer*.

05.08 Internal clearance

05.08.01
radial internal clearance (bearing capable of taking purely radial load, non-preloaded)
The arithmetical mean of the *radial distances* through which one of the *rings* or *washers* may be displaced relative to the other, from one eccentric extreme position to the diametrically opposite extreme position, in different angular directions and without being subjected to any external load. The mean value includes displacements with the rings or washers in different angular positions relative to each other and with the set of *rolling elements* in different angular positions in relation to the rings or washers.

05.08.02
theoretical radial internal clearance (radial contact bearing)
Outer ring raceway contact diameter minus the *inner ring* raceway contact diameter minus twice the *rolling element* diameter.

05.08.03
axial internal clearance (bearing capable of taking axial load in both directions, non-preloaded)
The arithmetical mean of the *axial distances* through which one of the *rings* or *washers* may be displaced relative to the other, from one axial extreme position to the opposite extreme position, without being subjected to any external load. The mean value includes displacements with the rings or washers in different angular positions relative to each other and with the set of *rolling elements* in different angular positions in relation to the rings or washers.

06 Torque, loads and life

06.01 Torque

06.01.01
starting torque
The torque required to start rotation of one *bearing ring* or *washer* with the other ring or washer held stationary.

06.01.02
running torque
The torque required to restrain motion of one *bearing ring* or *washer* while the other ring or washer is rotated.

06.02 Actual loads

06.02.01
radial load
A load acting in a direction perpendicular to the *bearing axis*.

06.02.02
axial load
A load acting in a direction parallel with the *bearing axis*.

06.02.03
centric axial load

An *axial load* the line of action of which coincides with the *bearing axis*.

06.02.04
static load
A load acting on a *bearing* when the speed of rotation of its *rings* or *washers* in relation to each other is zero (*radial* or *thrust bearing*) or when there is no motion in the direction of rolling between its *raceway* members (*linear bearing*).

06.02.05
dynamic load
A load acting on a *bearing* when its *rings* or *washers* rotate in relation to each other (*radial* or *thrust bearing*) or when there is motion in the direction of rolling between its *raceway* members (*linear bearing*).

06.02.06
stationary inner ring [shaft washer] load
A load the line of action of which does not rotate in relation to the *inner ring* [*shaft washer*] of the *bearing*.

06.02.07
stationary outer ring [housing washer] load
A load the line of action of which does not rotate in relation to the *outer ring* [*housing washer*] of the *bearing*.

06.02.08
rotating inner ring [shaft washer] load
A load the line of action of which is rotating in relation to the *inner ring* [*shaft washer*] of the *bearing*.

06.02.09
rotating outer ring [housing washer] load
A load the line of action of which is rotating in relation to the *outer ring* [housing washer] of the *bearing*.

06.02.10
oscillating load
A load the line of action of which continually turns back and forth, through an angle of less than 2π rad, in relation to one or both *rings* or *washers* of the *bearing*.

06.02.11
fluctuating load
A load the magnitude of which varies.

06.02.12
indeterminate direction load
A load the direction of which cannot be satisfactorily determined and which therefore is considered as rotating or oscillating in relation to both *rings* or *washers* of the *bearing*.

06.02.13
preload
Force applied on a *bearing*, for example by axial adjustment against another bearing, before the "useful" load is applied (external preload), or force induced in a bearing by *raceway* and *rolling element* dimensions resulting in "negative clearance" (internal preload).

06.03 Equivalent loads

06.03.01
equivalent load
A general term for theoretical loads used in calculations and under which *rolling bearings*, in a specific respect, would react as they will under the actual load conditions.

06.03.02
static equivalent radial [axial] load
That *static radial load* [*static centric axial load*] which would cause the same total permanent deformation at the most heavily stressed *rolling element/raceway* contact of a *rolling bearing* as that which occurs under the actual load conditions.

NOTE — It has been proposed to substitute in this definition a maximum contact stress for the permanent deformation. This proposal is currently (1984) being studied by ISO/TC4.

06.03.03
dynamic equivalent radial [axial] load
That constant *stationary radial load* [constant *centric axial load*] under the influence of which a *rolling bearing* would have the same *life* as it will attain under the actual load conditions.

06.03.04
mean effective load
A constant mean load under which a *rolling bearing* would have the same *life* as it will attain under a *fluctuating load*.

06.04 Load ratings

06.04.01
basic static radial [axial] load rating
That *static radial load* [*static centric axial load*] which corresponds to a total permanent deformation of *rolling element* and *raceway*, at the most heavily stressed rolling element/raceway contact, of 0,0001 of the rolling element diameter if (in the case of a *roller bearing*) the rollers and raceway have, or are presumed to have, a common generatrix (full line contact) under zero load. In the case of a *single row angular contact bearing*, the radial load rating refers to the radial component of that load which causes a purely radial displacement of the *bearing rings* in relation to each other.

NOTE — It has been proposed to substitute in this definition a maximum contact stress for the permanent deformation. This proposal is currently (1984) being studied by ISO/TC4.

06.04.02
basic dynamic radial [axial] load rating
That constant *stationary radial load* [constant *centric axial load*] which a *rolling bearing* can theoretically endure for a *basic rating life* of one million revolutions. In the case of a *single row angular contact bearing*, the radial load rating refers to the radial component of that load which causes a purely radial displacement of the *bearing rings* in relation to each other.

06.05 Life

06.05.01
life (of an individual bearing)
The number of revolutions which one of the *bearing rings* or *washers* makes in relation to the other ring or washer before the first evidence of fatigue develops in the material of one of the rings or washers or one of the *rolling elements*. Life may also be expressed in number of hours of operation at a given constant speed of rotation.

06.05.02
reliability (in the context of bearing life)
For a group of apparently identical *rolling bearings*, operating under the same conditions, the percentage of the group that is expected to attain or exceed a specified *life*. The reliability of an individual rolling bearing is the probability that the bearing will attain or exceed a specified life.

06.05.03
median life
The *life* attained or exceeded by 50 % of a group of apparently identical *rolling bearings* operating under the same conditions.

06.05.04
rating life
A predicted value of *life* based on a *basic dynamic radial load rating* or a *basic dynamic axial load rating*.

06.05.05
basic rating life
The *rating life* associated with 90 % *reliability*.

06.05.06
adjusted rating life
The *basic rating life* adjusted for a *reliability* other than 90 % and/or non-conventional material properties and/or non-conventional operating conditions.

06.05.07
median rating life
The *rating life* associated with 50 % *reliability*, i.e. the predicted *median life* based on a *basic dynamic radial load rating* or a *basic dynamic axial load rating*.

06.06 Calculation factors

06.06.01
radial [axial] load factor
A multiplication factor applied to the *radial load* [*axial load*] when calculating an *equivalent load*.

06.06.02
rotation factor
A multiplication factor which was sometimes applied (in addition to the *radial load factor*) to the *radial load* when calculating the *dynamic equivalent load* for a bearing with a *rotating outer ring load*. No longer applied according to ISO International Standards.

06.06.03
life factor
A multiplication factor applied to the *dynamic equivalent load* in order to obtain the *basic dynamic radial load rating* or the *basic dynamic axial load rating* corresponding to a given *rating life*.

06.06.04
speed factor
A multiplication factor applied to the *basic dynamic radial load rating* or the *basic dynamic axial load rating* corresponding to a given *rating life*, expressed in hours of operation at a certain speed of rotation, in order to obtain the load rating corresponding to the same rating life at a different speed.

06.06.05
life adjustment factor
A multiplication factor applied to the *basic rating life* in order to obtain an *adjusted rating life*.

07 Miscellaneous

07.01 Housings

07.01.01
(bearing) housing
Part of a *bearing* mounting, surrounding the bearing and having an inside surface matching the outside surface of the bearing *outer ring* or *housing washer* or of the *aligning housing ring* or *aligning seat washer*. (Figures 101, 102, 104 to 107.)

07.01.02
plummer block
pillow block (CDN and USA)
An assembly comprising a *radial bearing* and a *bearing housing* which has a base plate with bolt holes for its mounting on a support surface nominally parallel with the *bearing axis*. (Figure 101.)

07.01.03
plummer block housing
pillow block housing (CDN and USA)
The *bearing housing* of a *plummer block* (*pillow block*). (Figures 101, 102, 104.)

07.01.04
flanged housing
A *bearing housing* with a radial flange with bolt holes for its mounting on a support surface nominally perpendicular to the *bearing axis*. (Figures 105, 106.)

07.01.05
take-up housing
A *bearing housing* which has a facility for its adjustment relative to its support in a given direction nominally perpendicular to the *bearing axis*. (Figure 107.)

07.02 Location and securing

07.02.01
bearing seating
That portion of a shaft on which a *bearing* is mounted or that portion of a *bearing housing* in which the bearing is mounted. (Figures 102 to 107.)

07.02.02
shaft [housing] shoulder
A portion of a shaft [*housing*], projecting from the *bearing seating* surface and intended for axial location of the *bearing*. (Figures 102, 103.)

07.02.03
adapter sleeve
An axially slotted sleeve with a cylindrical bore, a tapered outside surface and a male screw thread at its small end. Used (with a *locknut* and a *lockwasher*) for the mounting of a *bearing* with *tapered bore* on a cylindrical outside surface of a shaft. (Figures 101, 108.)

07.02.04
withdrawal sleeve
An axially slotted sleeve with a cylindrical bore, a tapered outside surface and a male screw thread at its large end. Used for mounting and dismounting (by means of a nut) of a *bearing* with *tapered bore* on a cylindrical outside surface of a shaft. (Figure 109.)

07.02.05
locknut (for axial location of rolling bearings)
A nut with a cylindrical outside surface with axial slots for locking of the nut by one of the outer tabs of a *lockwasher* and for the application of a hook spanner. (Figures 101, 110.)

07.02.06
lockwasher (for locknut)
A sheet steel washer with a plurality of outer tabs, one of which is used for locking a *locknut*, and one inner tab intended to enter the axial slot in an *adapter sleeve* or in a shaft. (Figures 101, 111.)

07.02.07
eccentric locking collar
A steel ring having a recess on one side which is eccentric in relation to the bore and fits over an equally eccentric extension of the *inner ring* of an *insert bearing*. The collar is turned in relation to the inner ring until it locks and then secured to the shaft by tightening of a grub screw (set screw, retaining screw). (Figure 112.)

07.02.08
concentric locking collar
A steel ring fitting over the extended *inner ring* of an *insert bearing* and having grub screws (set screws, retaining screws) which pass through holes in the inner ring to make contact with the shaft. (Figure 113.)

4 Figures

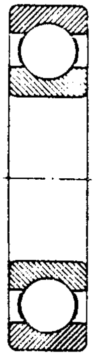

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Figure 1

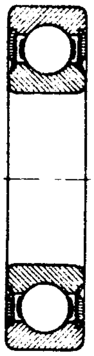

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Figure 2

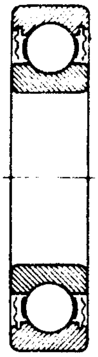

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Figure 3

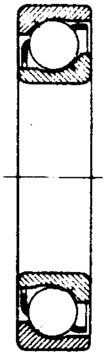

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Figure 4

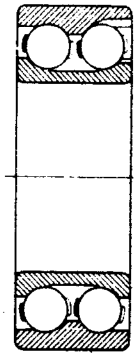

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Figure 5

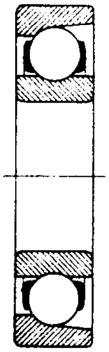

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Figure 6

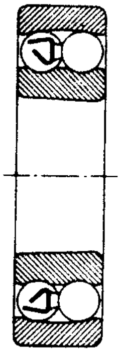

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Figure 7

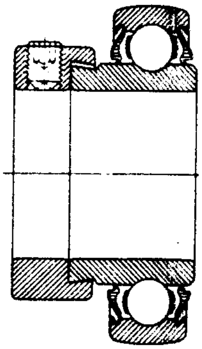

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Figure 8

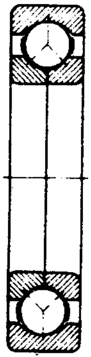

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Figure 9

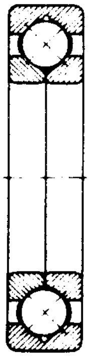

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Figure 10

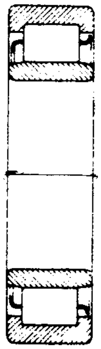

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Figure 11

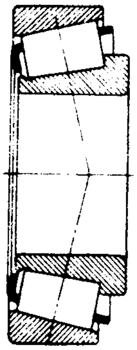

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Figure 12

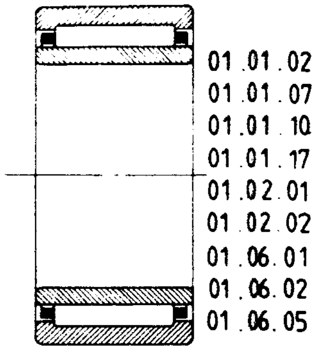


Figure 13

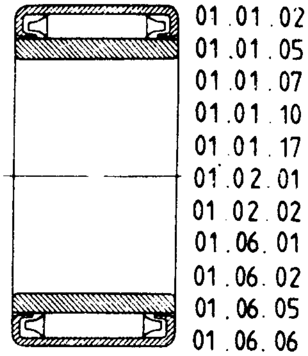


Figure 14

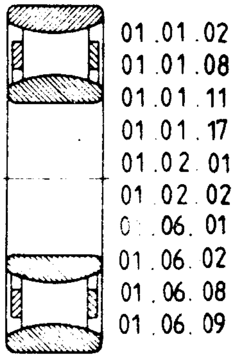
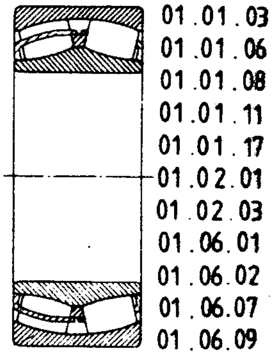


Figure 15



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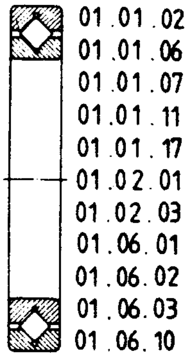

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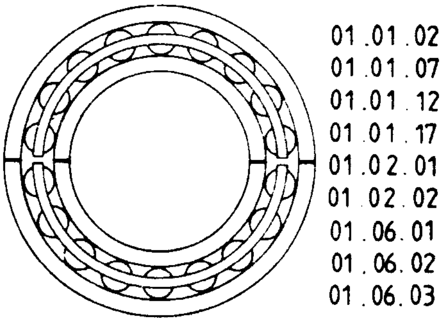

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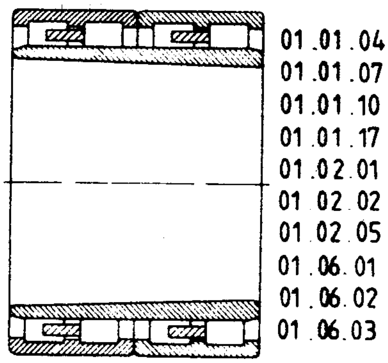

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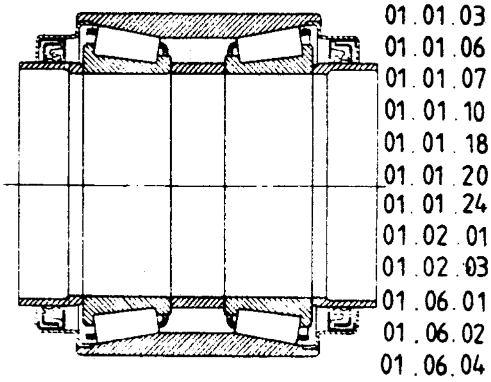

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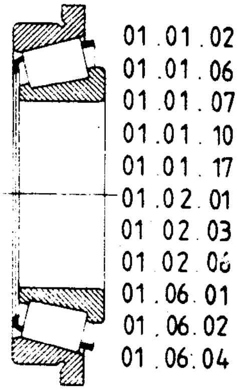

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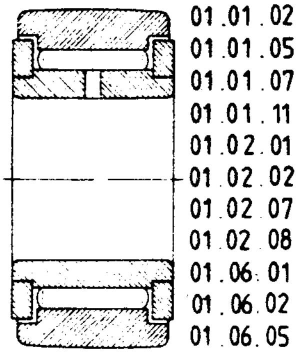

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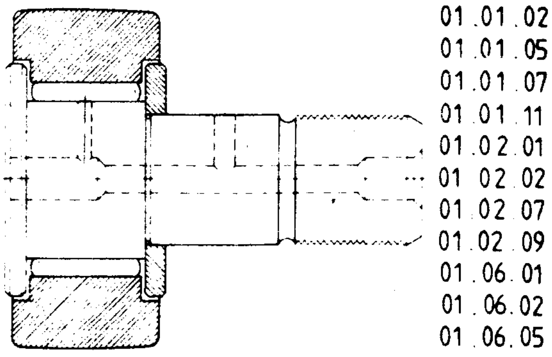

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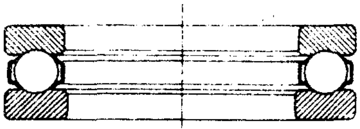

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Figure 24

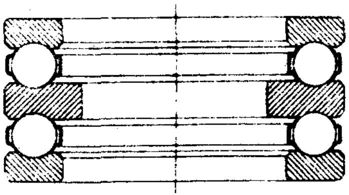

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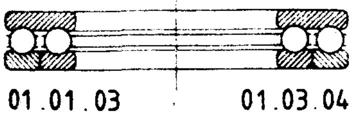
Figure 25



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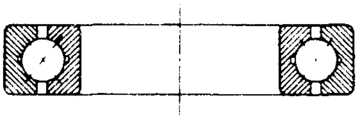

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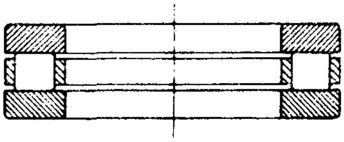

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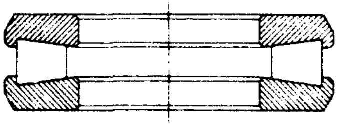

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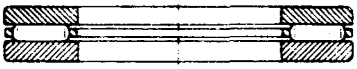

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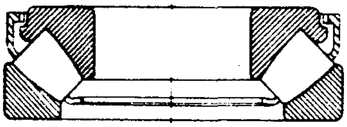

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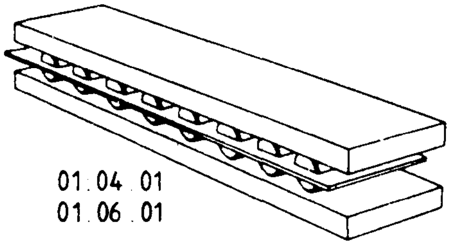

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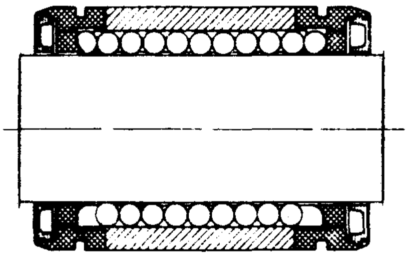

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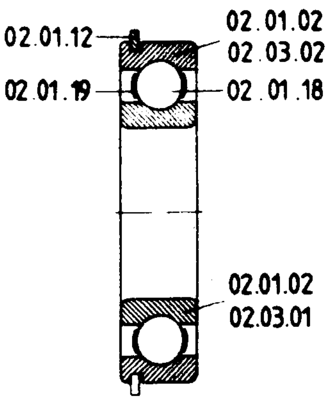

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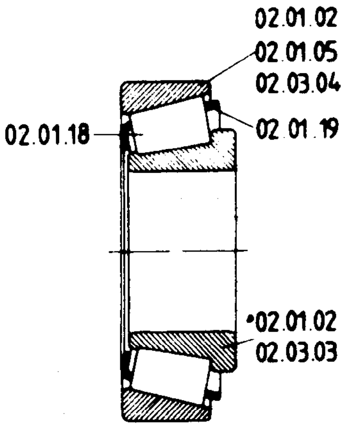

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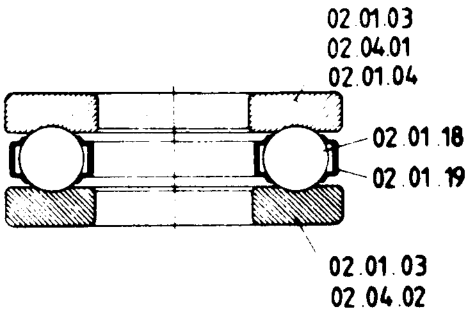

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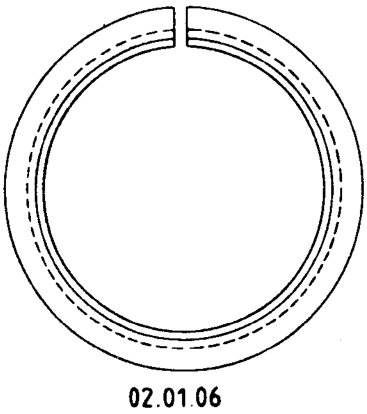

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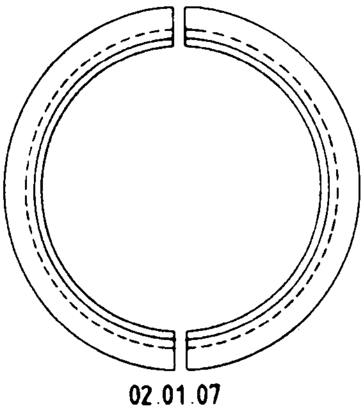

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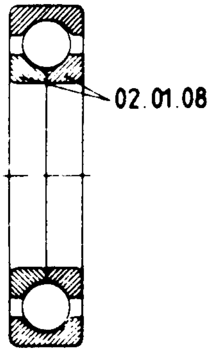

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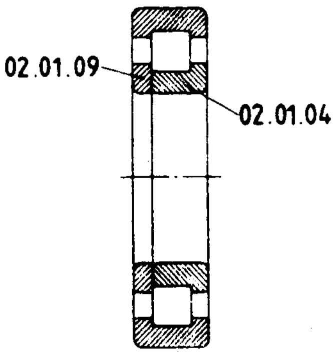

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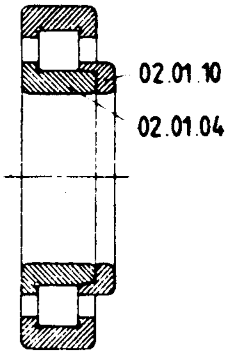

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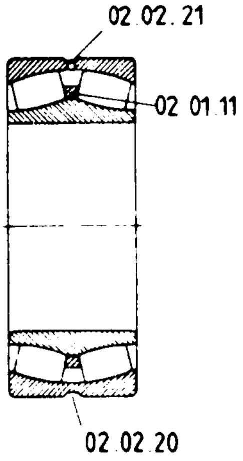

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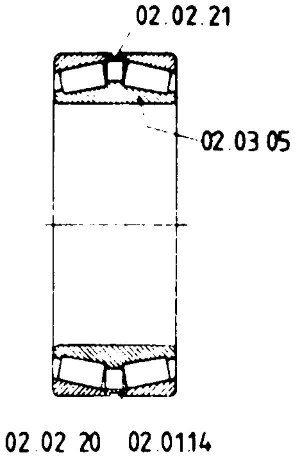

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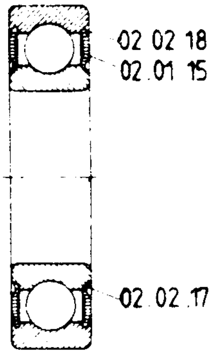

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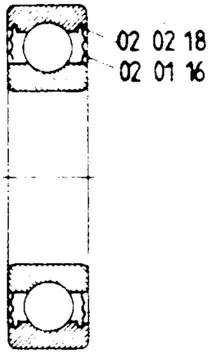

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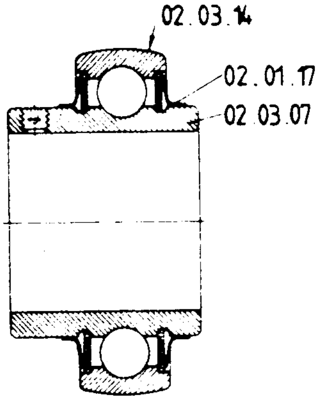

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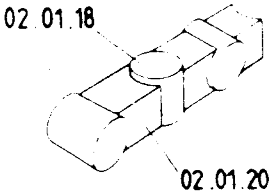

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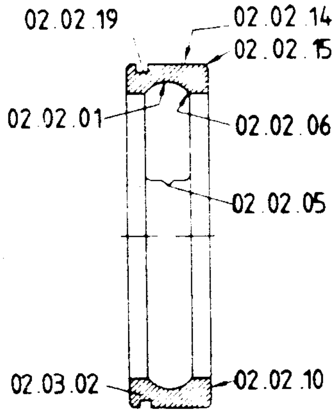

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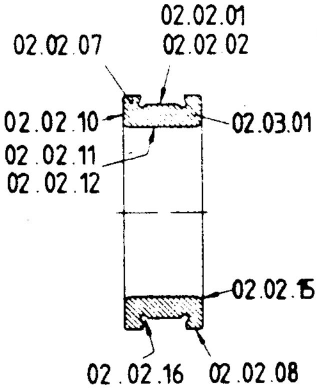

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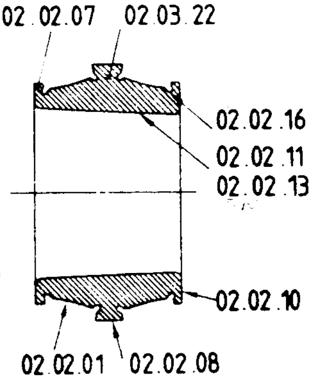

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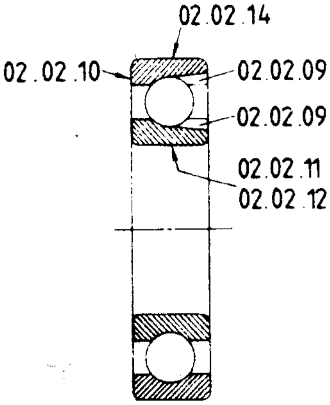

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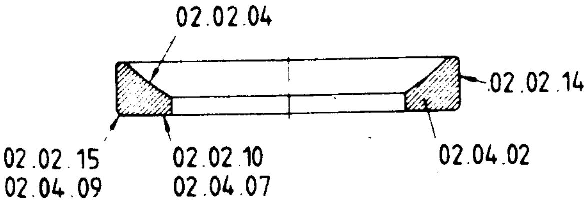

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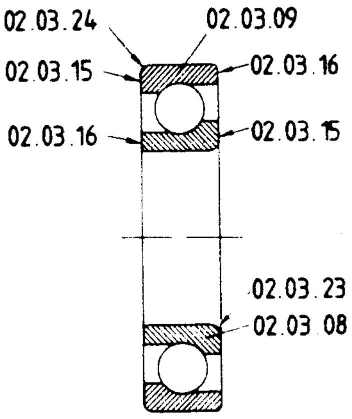

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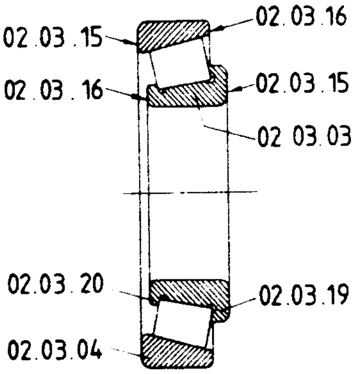

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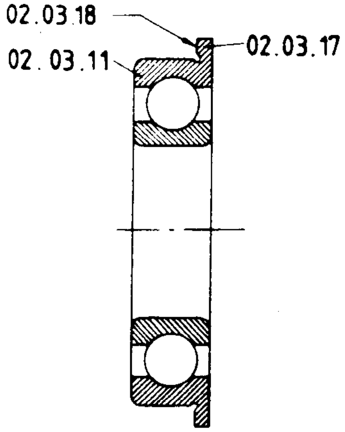

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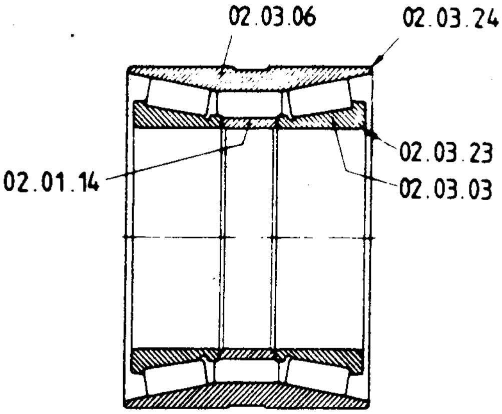

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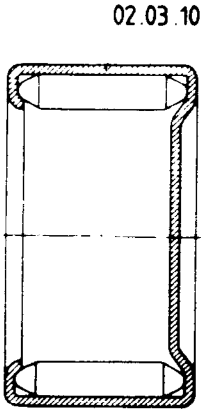

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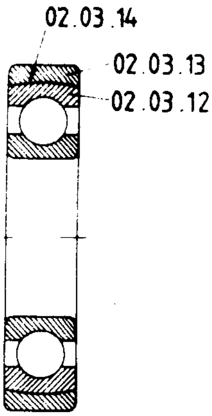

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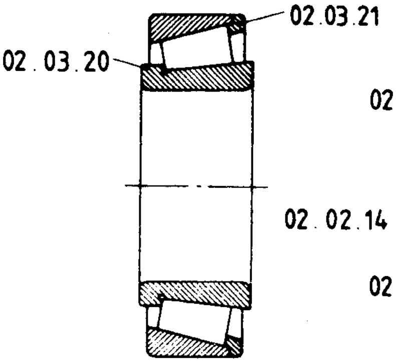

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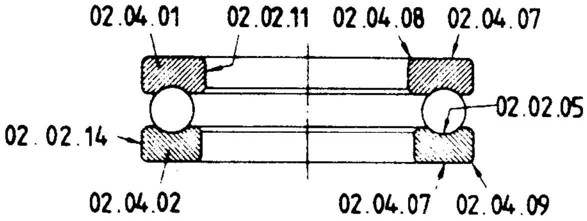

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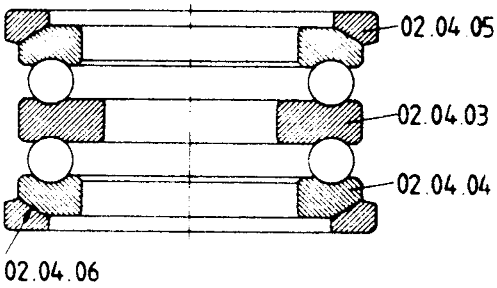

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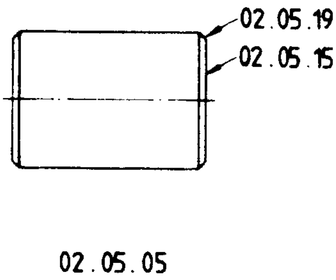

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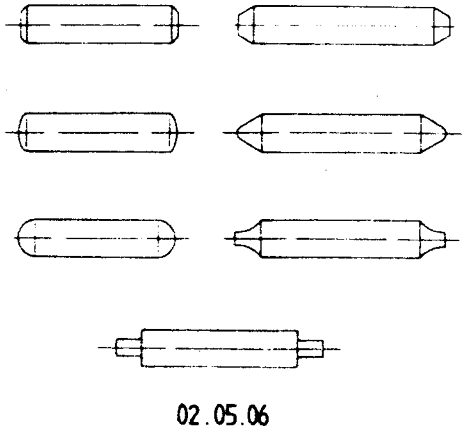

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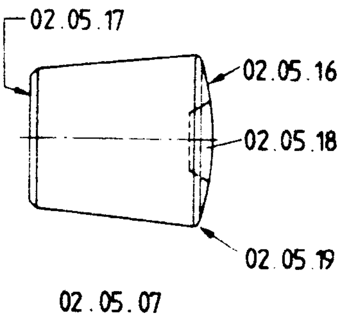

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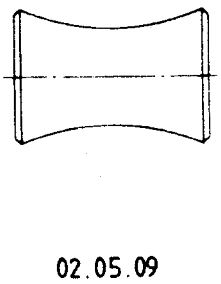

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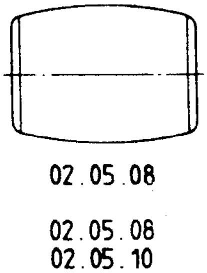

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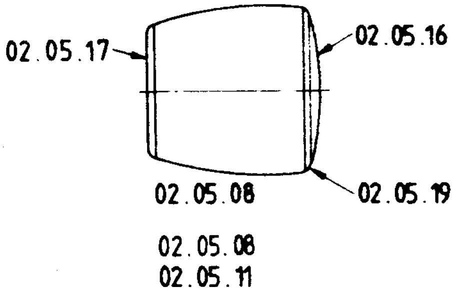

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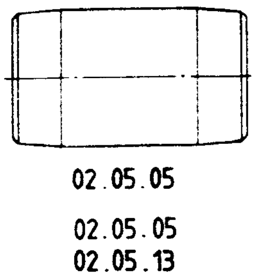

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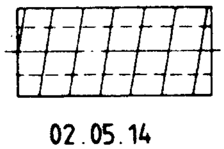

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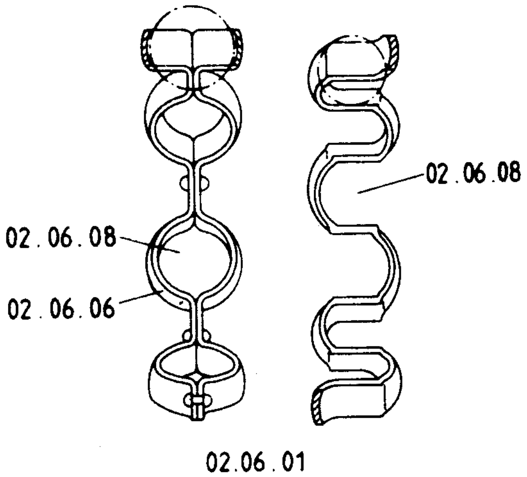

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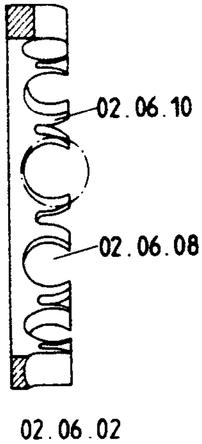

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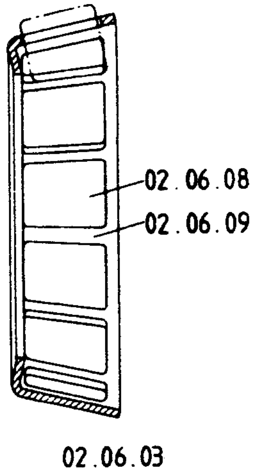

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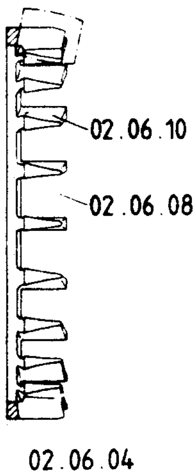

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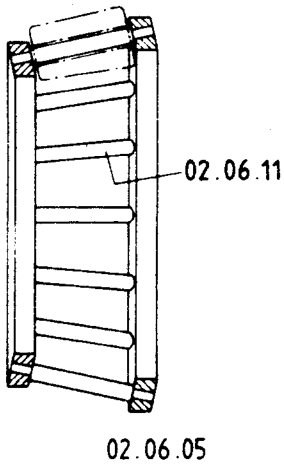

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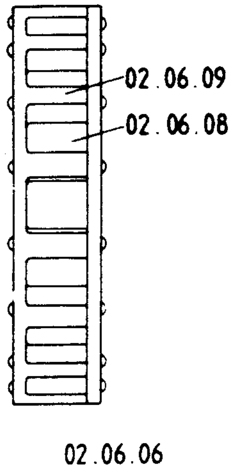

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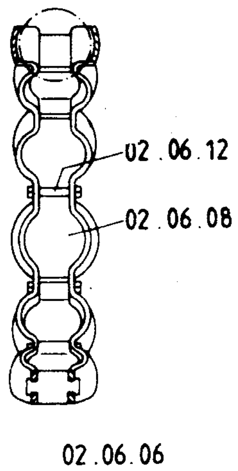

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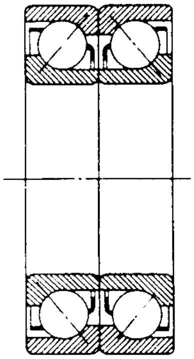

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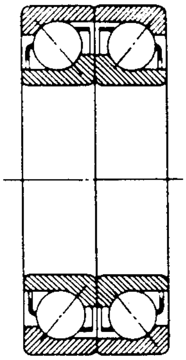
Figure 77



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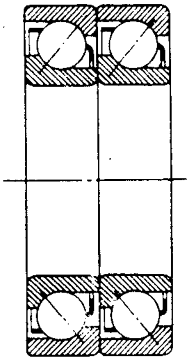

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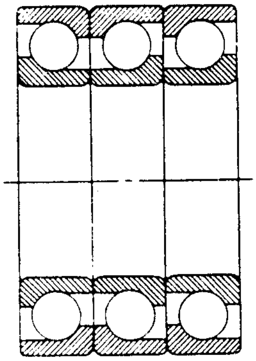

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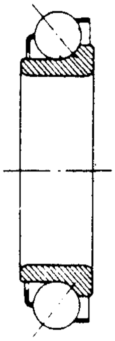

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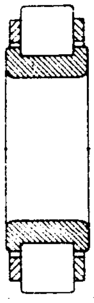
Figure 81



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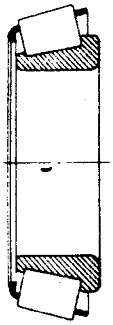
03.02.03

Figure 82



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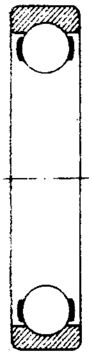

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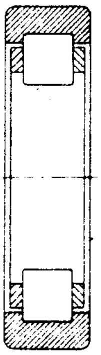
Figure 84



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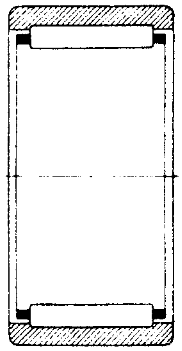

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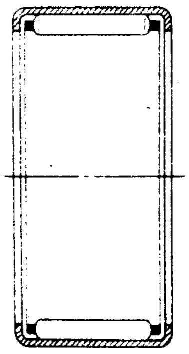

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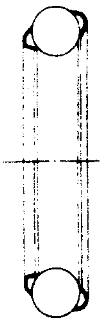
Figure 87



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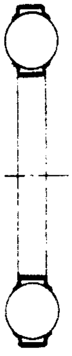

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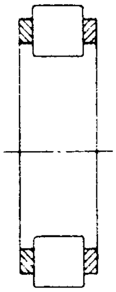

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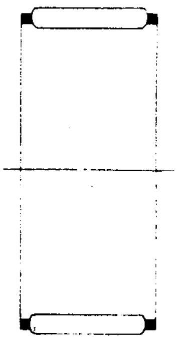

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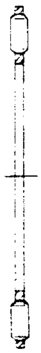

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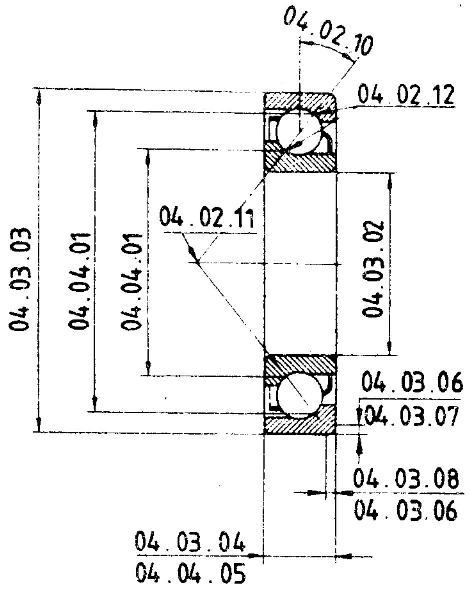


Figure 93

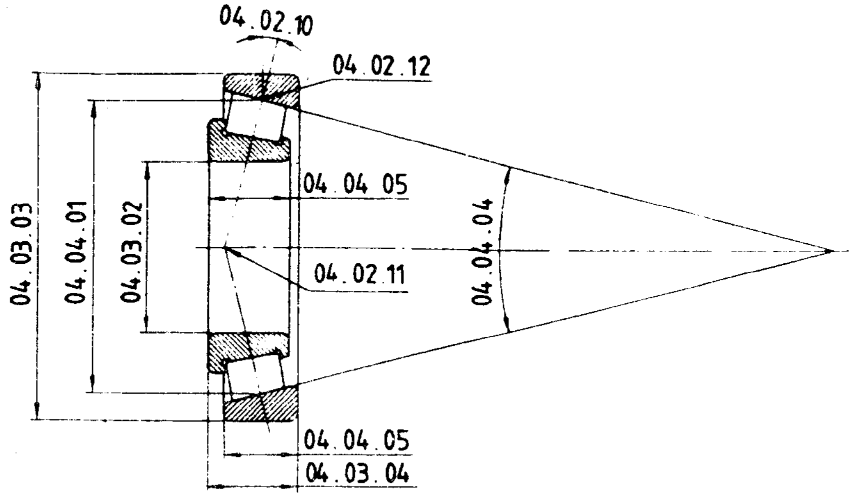


Figure 94

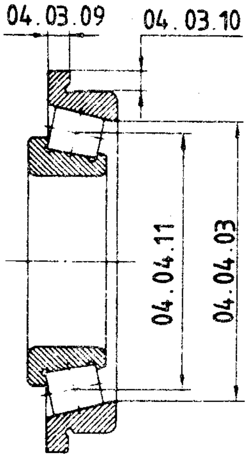


Figure 95

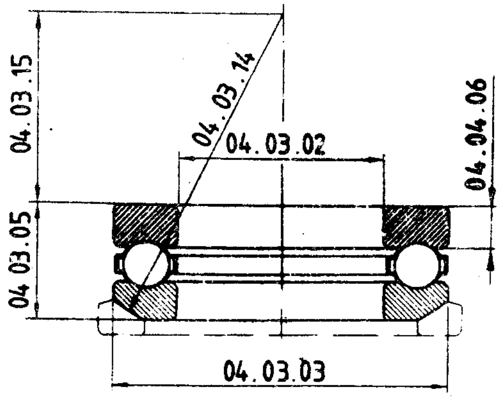


Figure 96

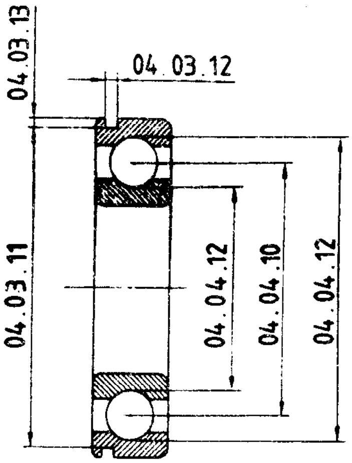
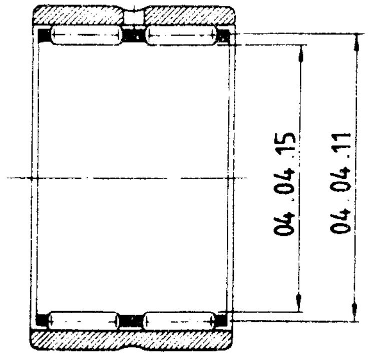


Figure 97



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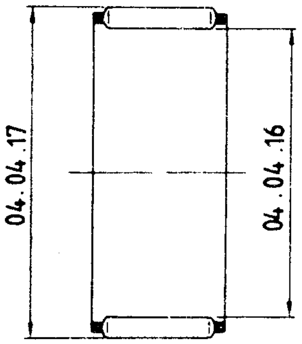

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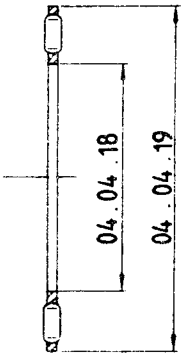

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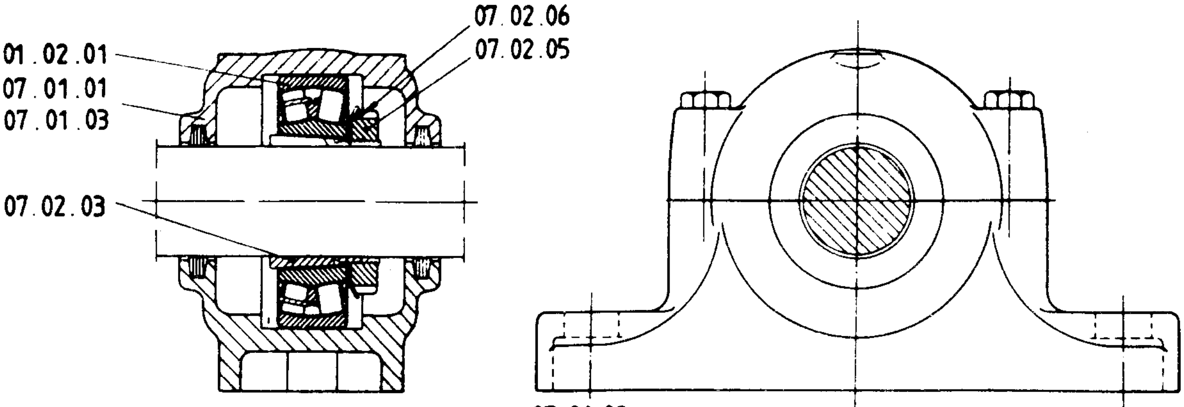

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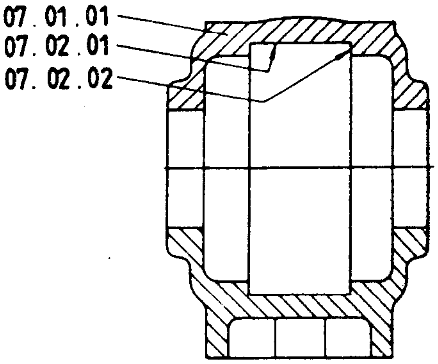

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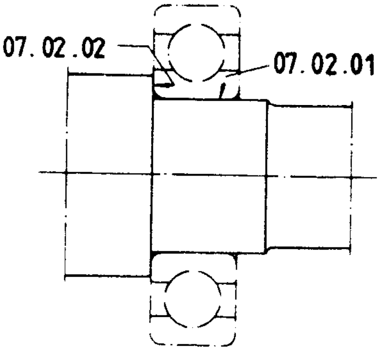

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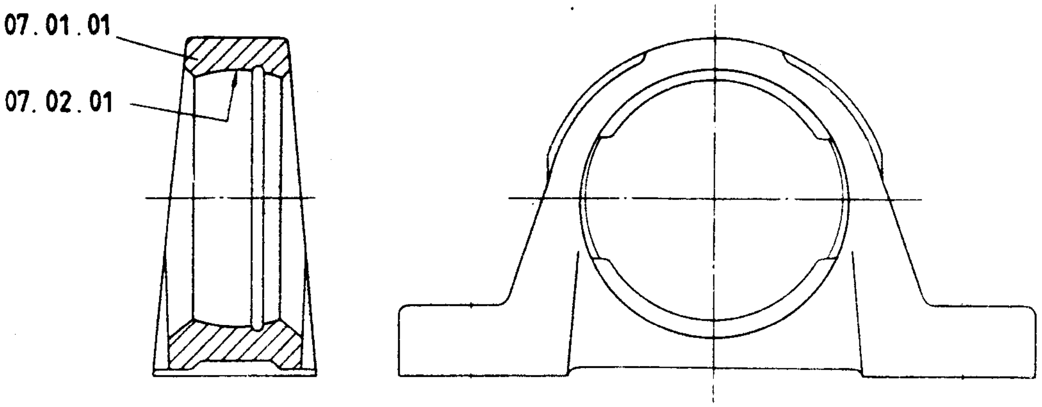

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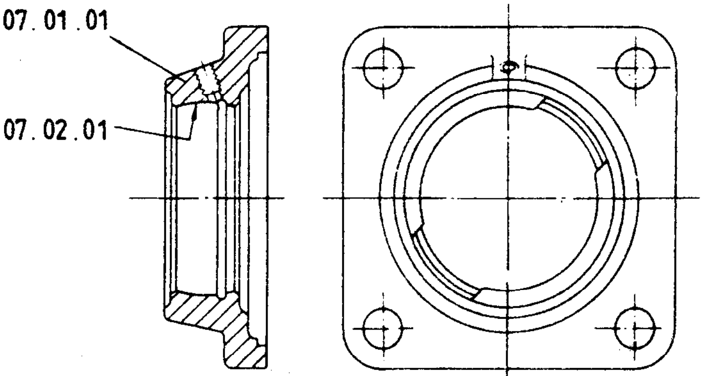

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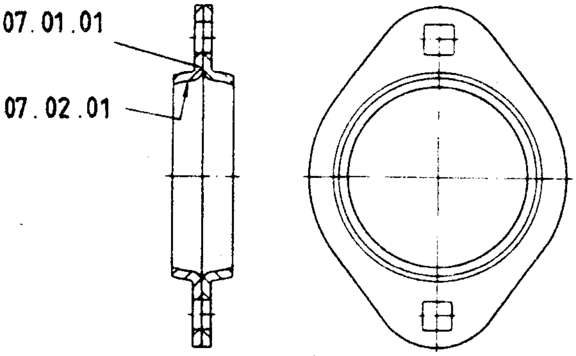

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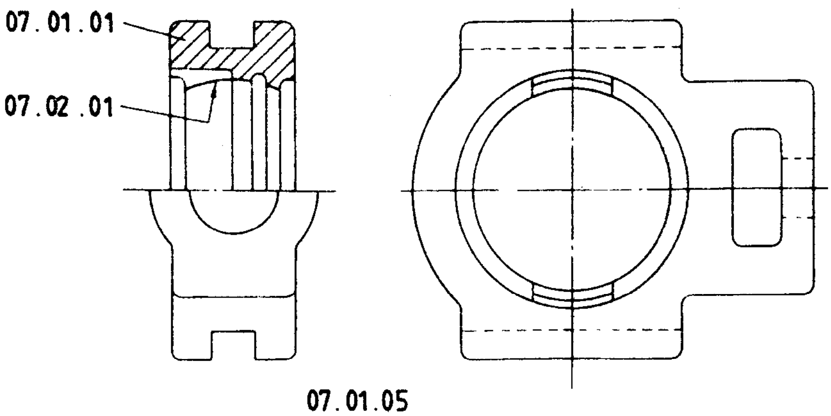

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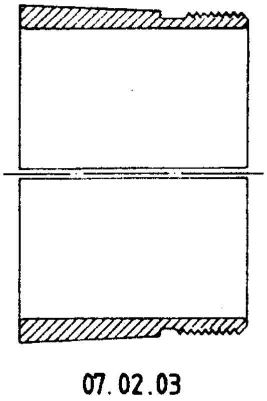

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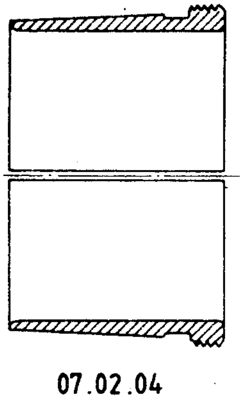
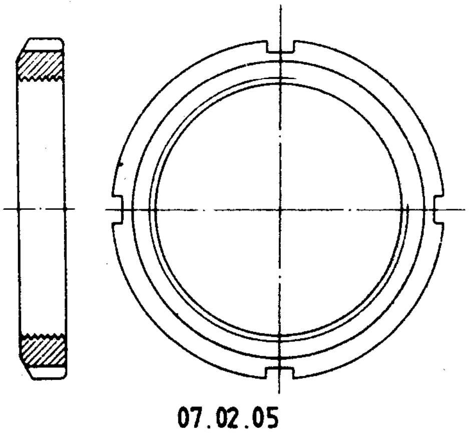


Figure 109



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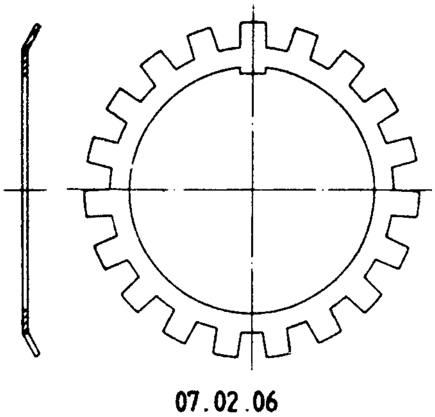

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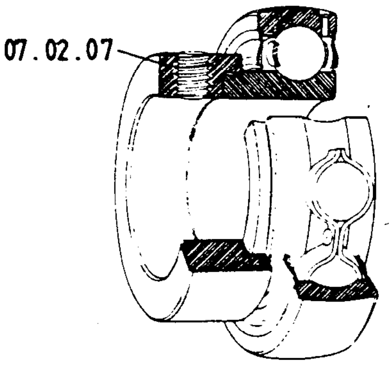

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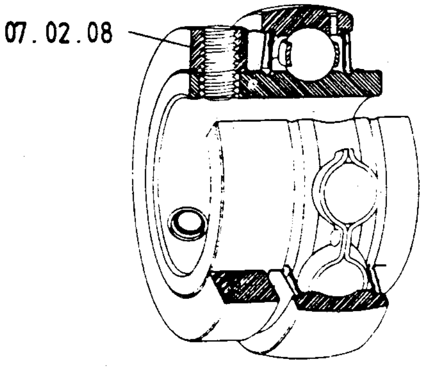

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[1] Term which has been used for several different bearings, e.g. 01.01.25, 01.02.10 and 01.05.09.

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factor	life adjustment factor	06.06.05
	life factor	06.06.03
	radial [axial] load factor	06.06.01
	rotation factor	06.06.02
	speed factor	06.06.04
filling	filling slot	02.02.09
	filling slot (ball) bearing	01.05.05
flange	flange height	04.03.10
	flange width	04.03.09
	outer ring flange	02.03.17
	(outer ring) flange back face	02.03.18
flanged	flanged housing	07.01.04
	flanged outer ring	02.03.11
	flanged (rolling) bearing	01.02.06
flinger	flinger	02.01.17
fluctuating	fluctuating load	06.02.11
follower	cam follower (rolling bearing) (*deprecated in this sense*)	01.02.07
form	deviation from circular form	05.06.01
	deviation from cylindrical form	05.06.02
	deviation from spherical form	05.06.03
four	four point contact (ball) bearing	01.05.09
fractured	double-fractured (rolling) bearing (*deprecated in this sense*)	01.01.12
front	cone front face rib	02.03.20
	cup front face rib	02.03.21
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full	full complement (rolling) bearing	01.01.05
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	(lot) deviation from ball gauge	05.04.10
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	(roller) gauge lot	05.05.08
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generatrix	variation of outside surface generatrix inclination with face	05.07.09
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	roller grade	05.05.10
grinding	grinding undercut	02.02.16
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hole	lubrication hole	02.02.21
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	aligning housing washer	02.04.04
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	housing shoulder	07.02.02
	housing washer	02.04.02
	housing washer axis	04.02.03
	housing washer back face	02.04.07
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	plummer block housing	07.01.03
	rotating housing washer load	06.02.09
	stationary housing washer load	06.02.07
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I

inch	inch (rolling) bearing	01.01.15
	inch series (rolling) bearing	01.01.16
inclination	variation of outside surface generatrix inclination with face	05.07.09
indeterminate	indeterminate direction load	06.02.12
inner	assembled bearing inner ring face runout with raceway	05.07.03
	(bearing) inner ring	02.03.01
	extended inner ring	02.03.07
	inner ring axis	04.02.02
	inner ring back face [front face] chamfer	02.03.23
	inner ring, cage and ball [roller] assembly	03.02.03
	inner ring raceway to bore thickness variation	05.07.10
	needle roller bearing without inner ring	03.02.06
	radial runout of assembled bearing inner ring	05.07.01
	rotating inner ring load	06.02.08
	stationary inner ring load	06.02.06
	stepped inner ring	02.03.08
insert	insert (rolling) bearing	01.02.04
inside	cup small inside diameter	04.04.03

instrument	instrument precision (rolling) bearing	01.01.23
interchangeable	interchangeable bearing ring [bearing washer]	02.01.05
	interchangeable (rolling) bearing (*deprecated in this sense*)	01.01.10
	interchangeable sub-unit	03.02.02
internal	axial internal clearance	05.08.03
	radial internal clearance	05.08.01
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L

land	cage riding land	02.02.08
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large	roller large end face	02.05.16
largest	largest permissible single chamfer dimension	05.03.05
length	actual length of a roller	05.05.06
	nominal length of a roller	05.05.05
	roller length	04.04.09
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	basic rating life	06.05.05
	life	06.05.01
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	recirculating ball [roller] linear bearing	01.04.02
load	axial load	06.02.02
	basic dynamic radial [axial] load rating	06.04.02
	basic static radial [axial] load rating	06.04.01
	centric axial load	06.02.03
	dynamic load	06.02.05
	dynamic equivalent radial [axial] load	06.03.03
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	fluctuating load	06.02.11
	indeterminate direction load	06.02.12
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	stationary outer ring [housing washer] load	06.02.07
locating	locating snap ring	02.01.12
locking	concentric locking collar	07.02.08
	eccentric locking collar	07.02.07
locknut	locknut	07.02.05
lockwasher	lockwasher	07.02.06
loose	loose rib	02.01.09
lot	ball lot	05.04.05
	(ball) lot diameter variation	05.04.07
	(ball) lot mean diameter	05.04.06
	(lot) deviation from ball gauge	05.04.10
	(roller) gauge lot	05.05.08
	(roller) gauge lot diameter variation	05.05.09
lubrication	lubrication groove	02.02.20
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M

magneto	magneto (ball) bearing	01.05.07
matched	matched pair	03.01.06
	matched stack	03.01.07
	matched (rolling) bearing	01.01.25
matching	universal matching (rolling) bearing	01.02.10
mean	(ball) lot mean diameter	05.04.06
	mean bore diameter [outside diameter]	05.01.05
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	mean diameter of a ball	05.04.03
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	single plane mean bore diameter [outside diameter]	05.01.07
	single plane mean bore diameter [outside diameter] deviation	05.01.08
	single plane mean roller diameter	05.05.03
median	median life	06.05.03
	median rating life	06.05.07
metric	metric (rolling) bearing	01.01.13
	metric series (rolling) bearing	01.01.14
middle	middle of raceway	04.04.02
motion	linear (motion) (rolling) bearing	01.04.01
mounting	duplex mounting (*deprecated*)	03.01.01
	paired mounting	03.01.01
	stack mounting	03.01.02
multi-	multi-row (rolling) bearing	01.01.04

N

needle	drawn cup needle roller bearing	01.06.06
	needle roller	02.05.06
	needle roller bearing without inner ring	03.02.06
	needle roller (radial) bearing	01.06.05
	needle roller thrust bearing	01.06.14
nominal	nominal ball diameter	05.04.01
	nominal bearing width [bearing height]	05.02.06
	nominal bore diameter [outside diameter]	05.01.01
	nominal chamfer dimension	05.03.01
	nominal contact angle	04.02.10
	nominal contact point	04.02.12
	nominal diameter of a roller	05.05.01
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non-	non-separable (rolling) bearing	01.01.11

O

open
open (rolling) bearing 01.01.17
open type (rolling) bearing (*deprecated*) 01.01.17

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outer
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(bearing) outer ring 02.03.02
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pin
cage pin 02.06.11
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pitch
pitch diameter of ball set 04.04.10
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plan
dimension plan 04.01.01

plane
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plummer block 07.01.02
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pocket
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point
four point contact (ball) bearing 01.05.09
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precision
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preload
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R

raceway
assembled bearing cone back face runout with raceway 05.07.04
assembled bearing cup back face runout with raceway 05.07.06
assembled bearing inner ring face runout with raceway 05.07.03
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	outside diameter of a ball [roller] and cage radial assembly	04.04.17
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	radial contact (rolling) bearing	01.02.02
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	radial internal clearance	05.08.01
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	radial load factor	06.06.01
	radial plane	04.02.05
	radial roller bearing	01.06.02
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	radial runout of assembled bearing inner ring	05.07.01
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	radial single chamfer dimension	05.03.02
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	spherical roller radial bearing (*deprecated*)	01.06.09
	static equivalent radial load	06.03.02
	tapered roller (radial) bearing	01.06.04
	theoretical radial internal clearance	05.08.02
radius	aligning surface radius	04.03.14
railway	railway axlebox (rolling) bearing	01.01.24
rating	adjusted rating life	06.05.06
	basic dynamic radial [axial] load rating	06.04.02
	basic rating life	06.05.05
	basic static radial [axial] load rating	06.04.01
	median rating life	06.05.07
	rating life	06.05.04
recess	roller recess	02.05.18
recirculating	recirculating ball [roller] linear bearing	01.04.02
reference	reference face of a ring [a washer]	04.02.13
reliability	reliability	06.05.02
relieved	relieved end roller	02.05.13
removable	removable sleeve (*deprecated in this sense*)	07.02.04
retaining	retaining snap ring	02.01.13
rib	centre rib	02.03.22
	cone back face rib	02.03.19
	cone front face rib	02.03.20
	cup front face rib	02.03.21
	loose rib	02.01.09
	rib	02.02.07
ribbon	ribbon cage	02.06.01
riding	cage riding land	02.02.08
	land riding cage	02.06.13
rigid	rigid (rolling) bearing	01.01.07
ring	aligning housing ring	02.03.13
	aligning outer ring	02.03.12
	assembled bearing inner ring face runout with raceway	05.07.03
	assembled bearing outer ring face runout with raceway	05.07.05
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